From: Jo Macpherson
To: Ken Hughey

Subject: RE: Document Link: Waitaki Final HEP Bottom Line - IN CONFIDENCE

Date: Monday, 6 June 2022 4:22:02 pm

Attachments: Waitaki Final HEP Bottom Line - DOC-7039324.docx

Here is your attachment Ken..

Cheers Jo

From: Ken Hughey <khughey@doc.govt.nz>

Sent: Monday, 6 June 2022 1:56 pm

To: Jo Macpherson < jmacpherson@doc.govt.nz>

Subject: FW: Document Link: Waitaki Final HEP Bottom Line - IN CONFIDENCE

Jo

Can you please open below in DOC-CM and send to me as an attachment?

I'm planning to summarise this opinion, the mitigation package options and existing investments in about a 1-2 pager for you and Mike for 5.30 tomorrow. Just as a starter for our 530pm mtg Thanks Ken

From: Herb Familton < hfamilton@doc.govt.nz >

Sent: Thursday, 2 June 2022 5:15 pm

To: Ken Hughey < khughey@doc.govt.nz>; Karina Morrow < kmorrow@doc.govt.nz>

Cc: Susan Newell < snewell@doc.govt.nz >

Subject: Document Link: Waitaki Final HEP Bottom Line

Waitaki Final HEP Bottom Line

https://doccm.doc.govt.nz:443/wcc/faces/wccdoc?dDocName=DOC-7039324

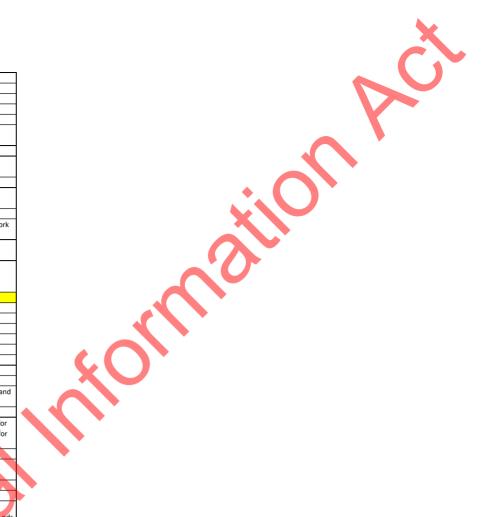
I've inserted Deans latest figure and used reserve bank NZ inflation calculator.

Herb

From: **Richard Maloney** Released under Official Information Act Ken Hughey To: Dean Nelson Cc:

Subject: Copy of Approximate current costs Waitaki catchment June 2022_ver2.xlsx

Work area	Work type	Work	Per annum	Significant recent one-offs	Notes
Upper river catchment	Weeds	river weed work J4N funded via	\$ 830,914		Zones 4 and 3A
Upper river catchment	Weeds	DOC	\$ 29,781		
Upper river catchment	Weeds		\$ 48,940		Tekapo and Dobson
Upper river catchment	Weeds	separate to above	\$ 15,000		Dobson
		funded rabbit control via in Tekapo, Ohau,			
Upper river catchment	Rabbits	Pukaki Tasman Ahuriri Godley riverbeds	\$ 610 584		
Upper river catchment	Rabbits	DOC in Tasman riverbed	\$ 127,868		
opper river cateriment	Nabbits	Soo iii Tasiiiaii Tiversea	Ų 127,000		
Upper river catchment	Staff costs not covered elsewhere	project	\$ 215,730		
Upper river catchment	Species management - kaki	Kaki management	\$ 242,466		
Opper river catcriment	Species management - Braided	Raki management	242,400		
Unana di sana sakaban sak	_	Towns Debon Helisters	\$ 5516		
Upper river catchment	riverbed bird surveys	Tasman Dobson Hakataramea	,		Destroyed by any dates a sector!
Upper river catchment	Species management - lizards	Lizard monitoring -	\$ 6,716		Protected by predator control
	Species management - threatened	Macrophyte control, trout barrier maintenance and	4 22 222		Includes some staff time for trout removal in Fork
Upper river catchment	fish	monitoring	\$ 23,200		Stream
	Species management -				
Upper river catchment	invertebrates	Grasshopper surveys and monitoring	\$ 8,065		
	Species management - threatened	Plant surveys, seeding and germination trials, monitoring			
Upper river catchment	and ephemeral plants	and survey	\$ 13,020		
Upper river catchment	Predator Control mammalian	Various species via	\$ 30,119		Quite a bit missing out of here
Upper river catchment	Predator Control mammalian	Various species via DOC	\$ 151,413	\$92,000	Huxley Hopkins for traps
Upper river catchment	Predator Control mammalian	Various species separate to above	\$ 60,000		Dobson, trap costs not available
Upper river catchment	Pest control - possum	Possum control Huxley Hopkins	\$ 112 805		
Upper river catchment	Predator Control avian	black-backed gull control	\$ 30,594		
Upper river catchment	Pest bird control	Canada goose control	\$ 57,957		
Upper river catchment	Outcome monitoring	BFT - Tasman predator control	\$ 9,912		
Upper river catchment	Research and management	Tier monitoring site Tasman Rv	\$ 15,000		
Upper river catchment	Research and management	DOC Uni Predator fence insects	\$ 10 000	\$130 000	one-off was recent fence build
					includes \$10k DOC support, University in-kind and
Upper river catchment	Research and management	DOC/Uni/ River dynamics research Cass	\$ 110,000	I	scholarships
Upper river catchment	Research and management	DOC grasshopper and weta field and advice	\$ 20,000		TSU time
rr		5	20,000		Calculated as 40% of total project costs (4 of 6 sites for
				I	invertebrates, 2 of 6 sites for lizards and 2 of 6 sites for
Upper river catchment	Research and management	DOC hedgehog impacts on invertebrate/lizard research	\$ 60 000		hedgehog trapping methods)
Upper river catchment	Weeds	Weeds and river works operation budget?	\$ 178,000		Lower Waitaki and Tekapo
opper river catchinent	Weeus	DOC/farmer River fence maintainence - Tekapo,	3 178,000		Lower Waltaki aliu Tekapo
I langer six or eatshment	Dabbit fancing		\$ 84.825		
Upper river catchment	Rabbit fencing	Pukaki, Ohau	, ,,,,,		Describle available with
Upper river catchment	Zone committee funding	Fencing and other river/wetland projects	\$ 104,000		Possible overlap with weed work?
Upper river catchment	Biosecurity funding	Weed control	\$ 20,000		
		DOC tenure review wetland and riverbed puchases			Crown contribution estimate for te e re w w nds
Upper river catchment	Tenure review	(eg Cass, Ahuriri riverbeds,Mt Gerald wetland)	\$ 7,128,000		and river areas
Lower Waitaki	Weeds	Meridian contribution to	\$ 375,000		Approx split from Jeff age em 11 April
Lower Waitaki	Weeds	weed control + mechanical works	\$ 375,000		Approx split from eff Pag email 1 April
Lower Waitaki	Weeds	Lower waitaki Geraldine ops team	\$ 70,000		
		Lower Waitaki ops budget for nga awa work going			
Lower Waitaki	Weeds	forward	\$ 90,000		
Freshwater work	Reseach and management	Nga Awa Waitaki river restoration report with costings		\$ 50,000.00	
	-	Nga Awa Waitaki R land encroachment study (from			ouple of years go but still a very relevant piece of
Freshwater work	Reseach and management	2019/20)		\$ 60,000.00	work/cost
	8	Nga Awa staff time: 0.5FTE Snr Ranger, 0.3FTE C Band and		7	
Freshwater work	Reseach and management	0.2FTE Tech Advisor	\$ 100,000		
Treshwater work	Research and management	0.21 TE TECH AGVISOR	7 100,000	_	
					work that will support nga awa restoration at Waitaki
		Nga Awa work on sediment movment in Rangitat -			and other rivers. Total cost was \$100k. Proportioned as
Freshwater work	Possach and management	9		\$ 5.00 0	I - I
riesilwatei work	Reseach and management	applicable to all braided rivers pro rated (1/4th)		3 00 0	1 out of 4 doc regions work is applicable too
					work that will support nga awa restoration at Waitaki
		Migatory Fish programme - guidance on Inanga			and other rivers. Total cost was \$20k. Proportioned as 1
Freshwater work	Reseach and management	monitoring pro rata (1/9th)		\$ 2,000.00	out of 9 doc regions work is applicable too
					work that will support nga awa restoration at Waitaki
		Migatory Fish programme - kanakana larval fishing			and other rivers. Total cost was \$15k. Proportioned as 1
Freshwater work	Reseach and management	methods pro rata (1/9th)		\$ 2,000.00	out of 9 doc regions work is applicable too
					work that will support nga awa restoration at Waitaki
		Migratory fish programme - glass eel reseach work pro			and other rivers. Total cost \$30k. Proportioned as 1 out
Freshwater work	Reseach and management	rata (1/9th)		\$ 3,000.00	of 9 doc regions work is applicable too
					work that will support nga awa restoration at Waitaki
		Migatory fish programme - NIWA report on eel trap and			and other rivers. Total cost \$30k Proportioned as 1 out
Freshwater work	Reseach and management	Migatory fish programme - NIWA report on eel trap and transfer pro rata (1/7th)			and other rivers. Total cost \$30k Proportioned as 1 out of 7 doc regions work is applicable too
Freshwater work	Reseach and management				
Freshwater work	Reseach and management		0		
Freshwater work	Reseach and management		O		of 7 doc regions work is applicable too
Freshwater work Freshwater work	Reseach and management Reseach and management	transfer pro rata (1/7th)	<u> </u>	\$ 3,000.00	of 7 doc regions work is applicable too work that will support nga awa restoration at Waitaki
		transfer pro rata (1/7th) CRESP programme - reduced flow scenarios with tout	9	\$ 3,000.00	of 7 doc regions work is applicable too work that will support nga awa restoration at Waitaki and other rivers. Total cost \$60k Proportioned as 1 out
		transfer pro rata (1/7th) CRESP programme - reduced flow scenarios with tout		\$ 3,000.00	of 7 doc regions work is applicable too work that will support nga awa restoration at Waitaki and other rivers. Total cost \$60k Proportioned as 1 out
		transfer pro rata (1/7th) CRESP programme - reduced flow scenarios with tout	<u> </u>	\$ 3,000.00	of 7 doc regions work is applicable too work that will support nga awa restoration at Waitaki and other rivers. Total cost \$60k Proportioned as 1 out of 2 doc regions work is applicable too
		transfer pro rata (1/7th) CRESP programme - reduced flow scenarios with tout and non migratory glaxias reseach pro rata (1/2)	\$ 6,000	\$ 3,000.00	of 7 doc regions work is applicable too work that will support nga awa restoration at Waitaki and other rivers. Total cost \$60k Proportioned as 1 out of 2 doc regions work is applicable too work that will support nga awa restoration at Waitaki
Freshwater work	Reseach and management Reseach and management	transfer pro rata (1/7th) CRESP programme - reduced flow scenarios with tout and non migratory glaxias reseach pro rata (1/2) Freshwater Biosecurity programme suppoor check	\$ 6,000 \$ 15,000	\$ 3,000.00	of 7 doc regions work is applicable too work that will support nga awa restoration at Waitaki and other rivers. Total cost \$60k Proportioned as 1 out of 2 doc regions work is applicable too work that will support nga awa restoration at Waitaki and other rivers. Total cost \$50k Proportioned as 1 out
Freshwater work Freshwater work	Reseach and management	transfer pro rata (1/7th) CRESP programme - reduced flow scenarios with t out and non migratory glaxias reseach pro rata (1/2) Freshwater Biosecurity programme suppo o check clean dry - pro rata (1/9th)		\$ 3,000.00	of 7 doc regions work is applicable too work that will support nga awa restoration at Waitaki and other rivers. Total cost \$60k Proportioned as 1 out of 2 doc regions work is applicable too work that will support nga awa restoration at Waitaki and other rivers. Total cost \$50k Proportioned as 1 out of 9 doc regions work is applicable too
Freshwater work Freshwater work	Reseach and management Reseach and management	transfer pro rata (1/7th) CRESP programme - reduced flow scenarios with tout and non migratory glaxias reseach pro rata (1/2) Freshwater Biosecurity programme suppo o check clean dry - pro rata (1/9th) Technical Support for Waitaki Ver (Col. etc)	\$ 15 000	\$ 3,000.00	of 7 doc regions work is applicable too work that will support nga awa restoration at Waitaki and other rivers. Total cost \$60k Proportioned as 1 out of 2 doc regions work is applicable too work that will support nga awa restoration at Waitaki and other rivers. Total cost \$50k Proportioned as 1 out
Freshwater work Freshwater work Terrestrial Science work	Reseach and management Reseach and management Reseach and management	transfer pro rata (1/7th) CRESP programme - reduced flow scenarios with t out and non migratory glaxias reseach pro rata (1/2) Freshwater Biosecurity programme suppo o check clean dry - pro rata (1/9th) Technical Support for Waitaki iver (Col etc) Woody vegetation restoration on E stern th Island limestone*	\$ 15 000	\$ 3,000.00	of 7 doc regions work is applicable too work that will support nga awa restoration at Waitaki and other rivers. Total cost \$60k Proportioned as 1 out of 2 doc regions work is applicable too work that will support nga awa restoration at Waitaki and other rivers. Total cost \$50k Proportioned as 1 out of 9 doc regions work is applicable too *These projects are on limestone ecosystems within the
Freshwater work Freshwater work Terrestrial Science work Terrestrial Science work	Reseach and management Reseach and management Reseach and management Reseach and management	transfer pro rata (1/7th) CRESP programme - reduced flow scenarios with t out and non migratory glaxias reseach pro rata (1/2) Freshwater Biosecurity programme suppo o check clean dry - pro rata (1/9th) Technical Support for Waitaki Ver (Col etc) Woody vegetation restoration on E stern th Island limestone* Control and influency of iny Vesw—ding grasses on	\$ 15 000 \$ 30,000	\$ 3,000.00	of 7 doc regions work is applicable too work that will support nga awa restoration at Waitaki and other rivers. Total cost \$60k Proportioned as 1 out of 2 doc regions work is applicable too work that will support nga awa restoration at Waitaki and other rivers. Total cost \$50k Proportioned as 1 out of 9 doc regions work is applicable too *These projects are on limestone ecosystems within the
Freshwater work Freshwater work Terrestrial Science work	Reseach and management Reseach and management Reseach and management	transfer pro rata (1/7th) CRESP programme - reduced flow scenarios with tout and non migratory glaxias reseach pro rata (1/2) Freshwater Biosecurity programme suppo o check clean dry - pro rata (1/9th) Technical Support for Waitaki Ver (Collect) Woody vegetation restoration on E stern th Island limestone* Control and influenciof invive swinding grasses on native plan	\$ 15 000 \$ 30,000	\$ 3,000.00	of 7 doc regions work is applicable too work that will support nga awa restoration at Waitaki and other rivers. Total cost \$60k Proportioned as 1 out of 2 doc regions work is applicable too work that will support nga awa restoration at Waitaki and other rivers. Total cost \$50k Proportioned as 1 out of 9 doc regions work is applicable too *These projects are on limestone ecosystems within the
Freshwater work Freshwater work Terrestrial Science work Terrestrial Science work	Reseach and management Reseach and management Reseach and management Reseach and management	transfer pro rata (1/7th) CRESP programme - reduced flow scenarios with tout and non migratory glaxias reseach pro rata (1/2) Freshwater Biosecurity programme suppo o check clean dry - pro rata (1/9th) Technical Support for Waitaki Ver (Col. etc) Woody vegetation restoration on E stern th Island limestone* Control and influence of invive sw—ding grasses on native plan. Rare calcicolou plant ropaga on and translocation; and	\$ 15 000 \$ 30,000	\$ 3,000.00	of 7 doc regions work is applicable too work that will support nga awa restoration at Waitaki and other rivers. Total cost \$60k Proportioned as 1 out of 2 doc regions work is applicable too work that will support nga awa restoration at Waitaki and other rivers. Total cost \$50k Proportioned as 1 out of 9 doc regions work is applicable too *These projects are on limestone ecosystems within the
Freshwater work Freshwater work Terrestrial Science work Terrestrial Science work	Reseach and management	transfer pro rata (1/7th) CRESP programme - reduced flow scenarios with t out and non migratory glaxias reseach pro rata (1/2) Freshwater Biosecurity programme suppo o check clean dry - pro rata (1/9th) Technical Support for Waitaki Ver (Col etc) Woody vegetation restoration on E stern th Island limestone* Control and influenc of inv ive sw ding grasses on native plan Rare calcicolou plant ropaga on and translocation; and Pollinators of rare alcicolous plants: diversity and	\$ 15 000 \$ 30,000 \$ 7,000	\$ 3,000.00	of 7 doc regions work is applicable too work that will support nga awa restoration at Waitaki and other rivers. Total cost \$60k Proportioned as 1 out of 2 doc regions work is applicable too work that will support nga awa restoration at Waitaki and other rivers. Total cost \$50k Proportioned as 1 out of 9 doc regions work is applicable too *These projects are on limestone ecosystems within the
Freshwater work Freshwater work Terrestrial Science work Terrestrial Science work Terrestrial Science work	Reseach and management	transfer pro rata (1/7th) CRESP programme - reduced flow scenarios with t out and non migratory glaxias reseach pro rata (1/2) Freshwater Biosecurity programme suppo o check clean dry - pro rata (1/9th) Technical Support for Waitaki ver (Col etc) Woody vegetation restoration on E stern th Island limestone* Control and influenc of inv ive sw ding grasses on native plan. Rare calcicolou plant ropaga on and translocation; and Pollinators of rare alcicolous plants: diversity and efficien y*	\$ 15 000 \$ 30,000 \$ 7,000 \$ 10,000	\$ 3,000.00	of 7 doc regions work is applicable too work that will support nga awa restoration at Waitaki and other rivers. Total cost \$60k Proportioned as 1 out of 2 doc regions work is applicable too work that will support nga awa restoration at Waitaki and other rivers. Total cost \$50k Proportioned as 1 out of 9 doc regions work is applicable too *These projects are on limestone ecosystems within the
Freshwater work Freshwater work Terrestrial Science work Terrestrial Science work Terrestrial Science work Terrestrial Science work	Reseach and management	transfer pro rata (1/7th) CRESP programme - reduced flow scenarios with t out and non migratory glaxias reseach pro rata (1/2) Freshwater Biosecurity programme suppo o check clean dry - pro rata (1/9th) Technical Support for Waitaki Ver (Col etc) Woody vegetation restoration on E stern th Island limestone* Control and influenc of inv ive sw ding grasses on native plan Rare calcicolou plant ropaga on and translocation; and Pollinators of rare alcicolous plants: diversity and	\$ 15 000 \$ 30,000 \$ 7,000 \$ 10,000 \$ 15,000	\$ 3,000.00	of 7 doc regions work is applicable too work that will support nga awa restoration at Waitaki and other rivers. Total cost \$60k Proportioned as 1 out of 2 doc regions work is applicable too work that will support nga awa restoration at Waitaki and other rivers. Total cost \$50k Proportioned as 1 out of 9 doc regions work is applicable too *These projects are on limestone ecosystems within the
Freshwater work Freshwater work Terrestrial Science work Terrestrial Science work Terrestrial Science work Terrestrial Science work	Reseach and management	transfer pro rata (1/7th) CRESP programme - reduced flow scenarios with t out and non migratory glaxias reseach pro rata (1/2) Freshwater Biosecurity programme suppo o check clean dry - pro rata (1/9th) Technical Support for Waitaki ver (Col etc) Woody vegetation restoration on E stern th Island limestone* Control and influenc of inv ive sw ding grasses on native plan. Rare calcicolou plant ropaga on and translocation; and Pollinators of rare alcicolous plants: diversity and efficien y*	\$ 15 000 \$ 30,000 \$ 7,000 \$ 10,000	\$ 3,000.00	of 7 doc regions work is applicable too work that will support nga awa restoration at Waitaki and other rivers. Total cost \$60k Proportioned as 1 out of 2 doc regions work is applicable too work that will support nga awa restoration at Waitaki and other rivers. Total cost \$50k Proportioned as 1 out of 9 doc regions work is applicable too *These projects are on limestone ecosystems within the



Work type	Work	Per an	าทเเพ	Significant recent one-offs	Notes
Work type Weed management	PRR	\$	158,614		37 Zones 4, 3A, 3B, 2
Research and management	Tern Island - PRR	\$	16,048	93,3	5. Lones 1, 511, 50, 2
Research and management	Lizard monitoring - PRR	\$	6,304	 	Protected by pr dator control
Research and management	Various species PRR	\$	152,663	\$ 20,0	00 Tasman, Tern Island
Research and management	PRR black-backed gull control	\$	24,447	20,0	
	2.2	+ -	- ',¬¬'	 	• • • • • • • • • • • • • • • • • • •
Research and management	DOC/Uni/PRR black fronted tern movements research	\$	100,000	1	
Research and management	DOC/PRR River terr invertebrate sampling	\$	50,000		
	DOC/PRR/ Tu Te Rakiwhanoa Mackenzie rivers	 	,550	4	
Research and management	invertebrate refence collection work	\$	30,000	~	Ψ°
PRR approx total		\$	538,076	\$ 115,33	7
	zased under)`			

Mt Gerald wetland 7 Godley Peaks TL abov Lower Cass Rv bed 9: Ben Avon pond area Birchwood swamp et Ahuriri River at Longs	e fan + TL river flats of tasman 400 49 re Sutherlands hut 100 2. Cant get the bit that is due to come out soon. down to east branch (river flats/swamps outside of Bic on Birchwood station 713 dip 100 on Huxley Gorge station at temple stream area? 576 the Wolds is	enAvon reserve) 123	461 400 749 100 500 est 123 713 100 576 164 150 31 400 200 85 4752
			ha Approx cost per ha Total contribution \$7,1
	inger		
20/02			

 From:
 Dean Nelson

 To:
 Ken Hughey

 Cc:
 Richard Maloney

Subject: RE: Ken"s view of the world - 30 May 2022

Date: Friday, 3 June 2022 2:53:58 pm

Attachments: Approximate current costs Waitaki catchment June 2022.xlsx

Right guys, here is the latest effort at bring the two together. Ursula is just back but due to finish also so I have done a really rough estimate on most of those areas in your email Richard. You will need to get the areas for the other ones on the PowerPoint to add in. I need to cut and run sorry.

Cheers, Dean

From: Ken Hughey < khughey@doc.govt.nz>

Sent: Friday, 3 June 2022 10:37 amTo: Dean Nelson <dnelson@doc.govt.nz>Cc: Richard Maloney <rmaloney@doc.govt.nz>Subject: RE: Ken's view of the world - 30 May 2022

This is great Dean – is there a simple way to bring the two SSs together into something sort of higher level? It might be one sheet covers whole river investments cross categories – woody weeds, predators, ... by zone or even by upper and lower river and by agency. Just something I can paint that bigger picture with but then with this material behind it. See you shortly – been a hectic morning so far.

Ken

From: Dean Nelson < dnelson@doc.govt.nz>

Sent: Thursday, 2 June 2022 4:59 pm **To:** Ken Hughey < khughey@doc.govt.nz>

Subject: RE: Ken's view of the world - 30 May 2022

Right Ken, I have added a few extra things in — predator control in Ohau Forests, also possum control in the same areas. I have tried to add a bit of vehicle costs into things and there is still a bit of weed work to come — put as anticipated weed control. PRR total now comes to \$495k plus \$20k for office overheads so that is \$515k. Rest is my salary and other overheads plus a months worth of salary to come. Hopefully that is a better reflection. Sorry it has taken so long. Hope this afternoon's mee ing went OK

Cheers, Dean

From: Ken Hughey < khughey@doc.govt.nz Sent: Wednesday, 1 June 2022 3:08 pm

To: Dean Nel on < dnelson@doc.govt.nz>

Subject: RE: Ken's view of the world - 30 May 2022

Thanks Dean

My 'test' for you at the end of the day. Hand on heart does it feel right? I don't care about exactly right, but ball park right!

From: Dean Nelson < dnelson@doc.govt.nz Sent: Wednesday, 1 June 2022 2:54 pm
To: Ken Hughey khughey@doc.govt.nz>

Subject: RE: Ken's view of the world - 30 May 2022

I have used a direct cost approach of getting hours out of the weeds GIS for example and probably that doesn't always reflect true costs – I can't easily factor in vehicle and herbicide costs. Also, what about the time spend entering and analyzing data and writing up reports – should I include that. I can do some more work around that.

There is not a lot else species wise that relates to PRR 'area of interest'. I have left out some things like knobbled weevil and the whole of the Ohau Forests possum (and more recently predator) control which is all for mistletoe and Pit pat. Should some or all of that be included?

From: Ken Hughey khughey@doc.govt.nz Sent: Wednesday, June 1, 2022 11:48 AM
To: Dean Nelson dnelson@doc.govt.nz>

Subject: RE: Ken's view of the world - 30 May 2022

Dean - thanks

Where are we putting all the other PRR work? Also, as you asked before, DOC's spend on species will be very significant I would have thought and looking forward to seeing that. Happy to chat!

From: Dean Nelson < dnelson@doc.govt.nz > Sent: Wednesday, 1 June 2022 9:45 am
To: Ken Hughey < khughey@doc.govt.nz >

Subject: RE: Ken's view of the world - 30 May 2022

Hi Ken,

Updated spreadsheet. I have tried to only include things that relate to PRR 'area of interest'
There are a couple of costs in there that you may already have under your totals that you have got from them. Not sure of all the stuff either as I have just trawled through SAP-BI to get that.

Get back to me if any questions

Cheers, Dean

From: Ken Hughey < khughey@doc.govt.nz > Sent: Wednesday. 1 June 2022 8:57 am

To: Dean Nelson dnelson@doc.govt.nz

Subject: RE: Ken's view of the world - 0 May 2022

Yes pse, if linked to 'river', e.g., terns, kaki_river monitoring

From: Dean Nelson < dnelson@doc.govt.nz > Sent: Tuesday, 31 May 2022 11:46 am
To: Ken Hughey < khughey@doc.govt.nz >

Subject: RE: Ken's view of the world - 30 May 2022

Hi Ken,

Progressing with expenses for the various zones. Do you want me to include species

management work as part of it?

Cheers, Dean

From Ken Hughey < khughey@doc.govt.nz >

Sent: Tuesday, 31 May 2022 11:21 am

To Dean Nelson < dnelson@doc.govt.nz; Nicki Atkinson < natkinson@doc.govt.nz; Colin

ODonnell <<u>CODONNELL@doc.govt.nz</u>>; Richard Maloney <<u>rmaloney@doc.govt.nz</u>>

Cc: Adrian Gilby agilby@doc.govt.nz; Aaron McKay aamckay@doc.govt.nz; Hughey, Kenneth

Subject: Ken's view of the world - 30 May 2022

Hi Team – please find attached a think piece as a starter for Thursday. This is not meant to be the definitive view of the world, but hopefully something to respond to.

Note I will not be at tomorrow's catch up meeting, and that after our workshop on Thursday I am heading off to meet with the 3 papatipu runanga at 1pm

Thanks and looking forward to Thursday morning.

Work type	Work	Dor	annum	Sub t	total	Significant recent one offe	Notes
Work type Weeds	river weed work J4N funded via	\$	830,914.00	JUD (totai	Significant recent one-offs	Zones 4 and 3A
						\$95337 in Lower Ohau 2019/20. Needs	
	PRR DOC	\$	158,614.00 29,781.00	-		doing every 2-3 years	Zones 4, 3A, 3B, 2
		\$	48,940.00				Tekapo and Dobson
	separate to above	\$	15,000.00	\$ 1	,068,249.00		Dobson
Rabbits	funded rabbit control via in Tekapo, Ohau, Pukaki, Tasman, Ahuriri, Godley riverbeds	\$	610,584.00				
	DOC in Tasman riverbed	\$	127,868.00	\$	738,452.00		
Chaff and a share of all and a		١.					
Staff costs not covered elsewhere Species management - kaki	project Wild kaki management	\$	215,730.00 81,039.00				
	Captive kaki management	\$	161,427.00	\$	242,466.00		
Species management - black-	Town Island DDD	_	46.040.00	_	46.040.00		
fronted tern Species management - Braided	Tern Island - PRR	\$	16,048.00	\$	16,048.00		
riverbed bird surveys	Tasman, Dobson, Hakataramea	\$	5,516.00				
Species management - lizards	Lizard monitoring -	\$	6,716.00		43 030 00		Protected by predator control
Species management - threatened	Lizard monitoring - PRR Macrophyte control, trout barrier maintenance and	\$	6,304.00	\$	13,020.00		Protected by predator control Includes some staff time for trout removal in Fork
fish	monitoring	\$	23,200.00				Stream
Species management - invertebrates	Grasshopper surveys and monitoring	Ś	8,065.00				
iliver tebrates	Grassnopper surveys and monitoring	٠	8,003.00				
Species management - threatened	Plant surveys, seeding and germination trials, monitoring						
and ephemeral plants Predator Control mammalian	and survey Various species via	\$	13,020.00 30,119.00				Quite a bit missing out of here
Predator Control mammanan	Various species via Various species via DOC	\$	151,413.00			\$92000 for traps	Huxley Hopkins
	Various species separate to above	\$	60,000.00			Trap costs not available	Dobson
	Various species PRR	\$	152,663.00	Ś	394,195.00	\$20000 Tern Island trap replacement	Tasman, Tern Island
Pest control - possum	Possum control Huxley Hopkins	\$	152,663.00	ډ	354,133.00	2020/21	rasmall, ICIII Isidiiu
Predator Control avian	black-backed gull control	\$	30,594.00				
Post hird control	PRR black-backed gull control	\$	24,447.00	\$	55,041.00		
Pest bird control Outcome monitoring	Canada goose control BFT - Tasman predator control	\$	57,957.00 9,912.00	\$	57,957.00 9,912.00		
Research and management	DOC Uni Predator fence insects	\$	10,000.00	\$	10,000.00	\$130,000	one-off was recent fence build
Possarch and management	DOC/Uni	,	110,000.00	,	110 000 00		includes \$10k DOC support, University in-kind and
Research and management	River dynamics research Cass	\$	110,000.00	\$	110,000.00		scholarships
Research and management	DOC/Uni/PRR black fronted tern movements research	\$	100,000.00	\$	100,000.00		
Research and management	DOC/PRR River terr invertebrate sampling	\$	50,000.00	\$	50,000.00		TCLLsing
Research and management	DOC grasshopper and weta field and advice DOC/PRR Tu Te Rakiwhanoa Mackenzie rivers	\$	20,000.00	\$	20,000.00		TSU time
Research and management	invertebrate refence collection work	\$	30,000.00	\$	30,000.00		
							Calculated as 40% of total project costs (4 of 6 sites for
Research and management	DOC hedgehog impacts on invertebrate/lizard research	Ś	60,000.00	Ś	60,000.00		invertebrates, 2 of 6 sites for lizards and 2 of 6 sites for hedgehog trapping methods)
Weeds	Weeds and river works operation budget?	\$	178,000.00	\$	178,000.00		3 3 3 3 4 7 5 3 3 3 3 3 3 3 3 3 3 3 3 3 3 3 3 3 3
	DOC/farmer River fence maintainence - Tekapo,	١.		١.			
Rabbit fencing Zone committee funding	Pukaki, Ohau Fencing and other river/wetland projects	\$	84,825.00 104,000.00	\$	84,825.00 104,000.00		
Biosecurity funding	Weed control	\$	20,000.00	\$	20,000.00		
	DOC tenure review wetland and riverbed puchases (eg Cass, Ahuriri riverbeds,Mt Gerald wetland)					\$3mill-\$7.5 mill ++	I haven't calculated this. but it will be at least this much
Lower Waitaki						, , ,	, , , , , , , , , , , , , , , , , , , ,
Weeds	Lavor voitali Caraldina ana taom	\$	48,000.00 70,000.00	\$	48,000.00 70,000.00		
	Lower waitaki Geraldine ops team Lower Waitaki ops budget for nga awa work going	٠	70,000.00	۶	70,000.00		
	forward	\$	90,000.00	\$	90,000.00		
Freshwater work							
Reseach and management	Nga Awa Waitaki river restoration report with costings					\$ 50,000.00	
-	Nga Awa Waitaki R land encroachment study (from						couple of years ago but still a very relevant piec of
	2019/20) Nga Awa staff time 0.5FTE Snr Ranger, 0.3FTE C Band and	_		_		\$ 60,000.00	work/cost
Reseach and management	0.2FTE Tech Advisor	\$	100,000.00	\$	100,000.00		
	Nga Awa work on sediment movment in Rangitat -						work that will support a awa re orat at W taki and other rivers. Total co as \$10 roporti ed as 1
	applicable to all braided rivers pro rated (1/4th)					\$ 25,000.00	out of 4 doc regions work licable
	Migatory Fish programme - guidance on Inanga						work that will supporting a awa rest tion at Waitaki and other rivers. Total t.was \$20. Proportioned as 1
Reseach and management	monitoring pro rata (1/9th)	L		L		\$ 2,000.00	out of 9 do egio orki able too
	Migatory Fish programme - kanakana larval fishing						work that II support ng wa restoration at Waitaki and her riv Total cost was \$15k. Proportioned as 1
Reseach and management	methods pro rata (1/9th)	L		L		\$ 2,000.00	out of oc regi work is applicable too
	Migratory fish programme - glass eel reseach work pro						ork that will upport nga awa restoration at Waitaki an the Ivers. Total cost \$30k. Proportioned as 1 out
Reseach and management	rata (1/9th)	L		L		\$ 3,000.00	of 9 doc regions work is applicable too
							words that will support
	Migatory fish programme - NIWA report on eel trap and						work that will support nga awa restoration at Waitaki and other rivers. Total cost \$30k Proportioned as 1 out
Reseach and management	transfer pro rata (1/7th)	L		L		\$ 3,0 0.00	of 7 doc regions work is applicable too
		_	· <u></u>	_			work that will support are one restriction
	CRESP programme - reduced flow scenarios with trout						work that will support nga awa restoration at Waitaki and other rivers. Total cost \$60k Proportioned as 1 out
Reseach and management	and non migratory glaxias reseach pro rata (1/2)					\$ 30,000.00	of 2 doc regions work is applicable too
							work that will support are one restriction as Miles
	Freshwater Biosecurity programme support to check						work that will support nga awa restoration at Waitaki and other rivers. Total cost \$50k Proportioned as 1 out
Reseach and management	clean dry - pro rata (1/9th)	\$	6,000.00	\$	0.00		of 9 doc regions work is applicable too
TSU Reseach and management	Technical Support for Waitaki River (Colin, etc)	Ś	15,000.00	5	5,000.0		
management	Woody vegetation restoration on Eastern South Island	Ť			, , , , , , , , , , , , , , , , , , ,		*These projects are on limestone ecosystems within the
Reseach and management	limestone*	\$	30 000.00	\$	30,000.00		Waitaki Valley
Reseach and management	Control and influence of invasive swarding grasses on native plant*	6	7, 00	5	7,000.00		
	Rare calcicolous plant propagation and translocation; and	1	., 00	1	, ,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,		
D	Pollinators of rare calcicolous plants diversity and	6		,	40.000		
Reseach and management Reseach and management	efficiency* Threatened Plant Monitoring in the Waitaki*	\$	10,0 .00	\$	10,000.00		
	, and the same and	Y	Total	٠,	3.753.165		

Total \$3,753,16

And distributions of the circle and the circle and

From: Adrian Gilby

To: Ken Hughey; Dean Nelson; Richard Maloney; Colin O"Donnell; Nicki Atkinson

Cc: <u>Aaron McKay</u>

Subject:Waitaki options workshop summary draftDate:Friday, 3 June 2022 2:29:28 pmAttachments:Waitaki workshop summary - draft.docx

Good Afternoon Everyone,

Attached, please find a draft document covering yesterday's workshop. This summary was compiled from the notes taken by our scribe Aaron with additional thought input from Ken. This summary has not yet been added to docCM. We are still smoothing language, etc, but wanted to get this to you for feedback asap.

I'd ask that everyone please take a look at the attached copy and provide comments **NLT than**10:00 am on Tuesday, 7 June. Apologies for the tight turnaround, but Ken has to present the summary to the Governance group on Tuesday afternoon. To speed along the process, please just make comments, corrections, additions, etc. directly to your attached copy (track changes should be on), save as a new file, and email directly to Aaron (with a cc to Ken and myself). We'll consolidate everything as quickly as we can.

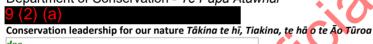
Please let me know if there are any questions and thank you again to everyone for your engagement and cooperation.

Cheers,

Adrian Gilby

National Systems Maintenance Advisor

Department of Conservation - Te Papa Atawhai



doc



From: <u>Aaron McKay</u>

To: <u>Ken Hughey</u>; <u>Adrian Gilby</u>

Subject: RE: Waitaki bottomline notes - KH edits 3 June 2022

Date: Friday, 3 June 2022 12:24:25 pm

Attachments: Waitaki bottomline notes - KH edits 3 June 2022.docx

Kia ora Kōrua,

Sorry about the delay, was just held up in a meeting.

Please find attached a few points. Have tried to address the comments in there but yes overall agreed with Adrian below.

Thanks for letting me be involved and let me know if there is anything else that I can provide on this.

Ngā mihi Aaron

From: Ken Hughey <khughey@doc.govt.nz>

Sent: Friday, 3 June 2022 11:32 am

To: Adrian Gilby <agilby@doc.govt.nz>; Aaron McKay <aamckay@doc.govt.nz>

Subject: RE: Waitaki bottomline notes - KH edits 3 June 2022

Thanks Adrian – just checking whether Aaron wants to come back to me or l just finalise and then you send out to participants?

From: Adrian Gilby agilby@doc.govt.nz>

Sent: Friday, 3 June 2022 11:01 am

To: Aaron McKay <aamckay@doc.govt.nz>; Ken Hughe <khughey@doc.govt.nz>

Subject: Waitaki bottomline notes - KH edits 3 June 2022

Hi Ken,

For my 2 cents, this looks really good. It builds on Aaron's summary and balances well the discussion yesterday, your paper, and the potential path options for leadership to consider. Please let me know if you need anything else on my end or if we can support your efforts. Really excellent read!

Cheers, Adrian

SISS

Sent from Workspace ONE Boxer

On 3/06/2022 10:03 am, Ken Hughey < khughey@doc.govt.nz > wrote:

Hi guys – see attached. Interest in thoughts about what is what we did and then my sort of conclusions at the end

From: **Herb Familton**

Ken Hughey; Karina Morrow To:

Cc: Susan Newell

Subject: Document Link: Waitaki Final HEP Bottom Line

Released under Official Information Act

From: Dean Nelson
To: Ken Hughey

Subject: RE: Ken"s view of the world - 30 May 2022

Date: Thursday, 2 June 2022 4:59:33 pm

Attachments: Work in zones for renegotiation.xlsx

Right Ken, I have added a few extra things in — predator control in Ohau Forests, also possum control in the same areas. I have tried to add a bit of vehicle costs into things and there is still a bit of weed work to come — put as anticipated weed control. PRR total now comes to \$495k plus \$20k for office overheads so that is \$515k. Rest is my salary and other overheads plus a months worth of salary to come. Hopefully that is a better reflection. Sorry it has taken so long Hope this afternoon's meeting went OK

Cheers, Dean

From: Ken Hughey < khughey@doc.govt.nz>
Sent: Wednesday, 1 June 2022 3:08 pm
To: Dean Nelson < dnelson@doc.govt.nz>

Subject: RE: Ken's view of the world - 30 May 2022

Thanks Dean

My 'test' for you at the end of the day. Hand on heart does it feel right? I don't care about exactly right, but ball park right!

From: Dean Nelson <<u>dnelson@doc.govt.nz</u>>
Sent: Wednesday, 1 June 2022 2:54 pm
To: Ken Hughey <<u>khughey@doc.govt.nz</u>>

Subject: RE: Ken's view of the world - 30 May 2022

I have used a direct cost approach of getting hours out of the weeds GIS for example and probably that doesn't always reflect true co is —I can't easily factor in vehicle and herbicide costs. Also, what about the time spend entering and analyzing data and writing up reports — should I include that. I can do some more work around that.

There is not a lot else species wise that relates to PRR 'area of interest'. I have left out some things like knobbled weevil and the whole of the Ohau Forests possum (and more recently predator) control which is all for mistletoe and Pit pat. Should some or all of that be included?

From: Ken Hughey khughey@doc.govt.nz Sent: Wednesday, June 1, 2022 11:48 AM
To: Dean Nelson dnelson@doc.govt.nz

Subject: RE: Ken's view of the world - 30 May 2022

Dean – thanks

Where are we putting all the other PRR work? Also, as you asked before, DOC's spend on species will be ve y significant I would have thought and looking forward to seeing that. Happy to chat! Ken

From: Dean Nelson < dnelson@doc.govt.nz Sent: Wednesday, 1 June 2022 9:45 am
To: Ken Hughey knughey@doc.govt.nz

Subject: RE: Ken's view of the world - 30 May 2022

Hi Ken,

Updated spreadsheet. I have tried to only include things that relate to PRR 'area of interest' There are a couple of costs in there that you may already have under your totals that you have got from them. Not sure of all the stuff either as I have just trawled through SAP-BI to get that.

Get back to me if any questions

Cheers, Dean

From: Ken Hughev <khughev@doc.govt.nz> Sent: Wednesday, 1 June 2022 8:57 am To: Dean Nelson < dnelson@doc.govt.nz >

Subject: RE: Ken's view of the world - 30 May 2022

Yes pse, if linked to 'river', e.g., terns, kaki, river monitoring

From: Dean Nelson <dnelson@doc.govt.nz> Sent: Tuesday, 31 May 2022 11:46 am To: Ken Hughey < khughey@doc.govt.nz>

Subject: RE: Ken's view of the world - 30 May 2022

Hi Ken.

Progressing with expenses for the various zones. Do you want me to include species

management work as part of it?

Cheers, Dean

From: Ken Hughey < khughey@doc.govt.nz> **Sent:** Tuesday, 31 May 2022 11:21 am

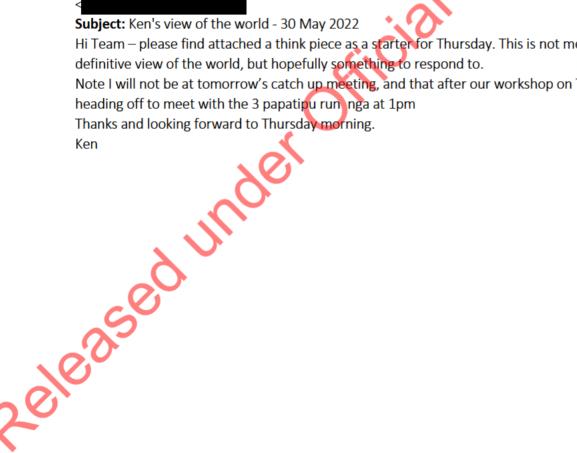
To: Dean Nelson dnelson@doc.govt.nz; Nicki Atkinson natkinson@doc.govt.nz; Colin O'Donnell < codonnell@doc.govt.nz; Richard Maloney < rmaloney@doc.govt.nz>

Cc: Adrian Gilby agilby@doc.govt.nz; Aaron McKay aamckay@doc.govt.nz; Hughey, Kenneth

Subject: Ken's view of the world - 30 May 2022

Hi Team – please find attached a think piece as a starter for Thursday. This is not meant to be the definitive view of the world, but hopefully something to respond to.

Note I will not be at tomorrow's catch up meeting, and that after our workshop on Thursday I am







	Date	Description	Site	Method	Contractor/staff	Who paid	Cost (excl GST) Comments
	2019/20	Weed control Weed Control	Lower Ohau Tern Island	Ground spray Ground spray			Note that this wasn't done this year but in 2019/20. Needs follow up every 2-3 years 3 816.00
		Weed Control Predator control and rat detection Cat control	Tern Island and lizard site Tern Island Tern Island	Ground spray Trapping rat dog data management Spotlighting	Staff Contractors and staff Staff		\$ 1908.00 \$ 79120.00 \$ 2616.00
		Predator monitoring Tern breeding monitoring Lakes skink monitoring	Tern Island Tern Island Tern Island site	Tracking tunnels Monitoring breeding success Mark recapture	Staff staff staff	PRR PRR PRR	\$ 1560.00 \$ 16048.00 \$ 3520.00
		Lakes and scree skink monitoring Kaki captive rearing	Benmore Gullies site Aviary	Mark recapture Captive rearing	staff Staff	PRR DOC	\$ 2164.00 \$ 161 427.00 Includes staff time and other costs
		Macrophyte control and threatened fish monitoring Threatened plant management	Fraser Stream and Waterwheel Wetland trout barriers Various sites	Spray and hand removal of macrophytes monitoring of fish Monitoring seed trials nursery	Staff Staff	DOC PRR	\$ 3 024.00 \$ 13 020.00 Half in this zone and half in Zone 4
		Weed control	Pukaki River	Ground spray	Staff and Aoraki	PRR	\$ 212.00
		Woody weed control Weed control Black-fronted tern tracking research	Lake Poaka and Waterwheel Wetland Fraser Stream and wetlands Darts Bush Stream Tern Island and Cass	Ground spray Ground spray Deploy GPS trackers	Tree and Scrub Control Staff Staff	PRR PRR	\$ 9 846.00 \$ 5 754.00 \$ 21.544.00 Combined DOC/University and PRR study. Other costs in Richards Spreadsheet
		Bittern tracking	Various wetlands	Deploy and co lect call recorders	Staff	PRR	\$ 4 230.00 PRR total \$165 358 (excludes \$95 337 in top row from 2019/20)
							.* .()
							X
							~~
							X O
							•
					* 0		
					CIO		
				S *			
			\ 0				
)				
		O.U.					
	1	V					
	2						
	U						
·							

:	Date Description Weed control Weed control Weed control 25/02/2022 Willow control and smal patch of lupins 9/03/2022 Lupin control U03/2022 Lupin control U03/2022 Lupin control U004/2022 Lupin control Woody weeds Woody weeds Macrophyte control and threatened fish monitoring Macrophyte control trout removal and threatened fish monitoring Jun-22 Anticipated willow control	Tributary of Omarama Stream Tributary of Omarama Stream Birchwood area Alburii River Alburii River and Ki lermont Spring-fed Stream protected by trout barrier Aburiri River	Method Aerial spray Aerial spray Aerial spray Aerial spray Aerial spray Aerial spray Ground spray Ground spray Ground spray Ground spray Spray and hand removal fish trap Spray and hand removal electric f Chainsaw and poison		Who paid DOC DOC PRR DOC PRR DOC PRR PRR PRR PRR PRR PRR PRR PRR PRR PR	Cost (exd GST) Comments 5 20 737.00 5 550.00 7 5 500.00 17 23.40 Problem inherited as a result of Tenure Review of Twin Peaks. Adjacent landowner also contributing to control lower down but unknown amount Problem inherited as a result of Tenure Review of Twin Peaks. Adjacent landowner also contributing to control lower down but unknown amount 7 20 5 20 5 20 5 20 5 20 5 20 5 20 5 20
						ailor
				• 6		
		. (ficial desired to the second s	7	
	S					
8	31697					

From: Nicki Atkinson

To: <u>Richard Maloney</u>; <u>Ken Hughey</u>

Cc: Dean Nelson; Colin O"Donnell; Hughey, Kenneth; Karina Morrow; Herb Familton

Subject: RE: Ken"s view of the world - 30 May 2022

Date: Wednesday, 1 June 2022 4:44:02 pm

Attachments: Copy of Approximate current costs Waitaki catchment June 2022 NA edits.xlsx

Lower Waitaki River Conservation and Restoration - Draft Report.msg

Hi Ken

I've added the bio costs to Richard's spreadsheet (attached), both the TSU costs as well as the costs across the Freshwater teams. There's not much in the way of Nga Awa work happening in the Waitaki at the moment, it's still in the 'set-up/development' phase but there's also a lot of other work happening nationally that would apply to the Waitaki, e.g. our work on understanding/improving trap and transfer for tuna. For these pieces of work I've pro-rated the cost based on the number of DOC regions the work is applicable too. You can choose whether to include this or not.

I've also included the Geraldine Ops work that I know about.

I think I sent this to you awhile back but will add it again in case you missed it - Nga Awa has commissioned a report on the Lower Waitaki and how to restore it, with costing for the restoration work, so highly relevant & useful for this work. See attac ed

Some other costs comparisons that may be of interest – Nga Awa got \$48M in Job for Nature money for fencing and planting and pest control across 6 river sites. One of these was the Rangatata catchment (both upper and lower) which got \$20M of the \$48M over four years. And to answer your question re Ngai Tahu engagement as Lunderstand from Brad Edwards, the Nga Awa River Ranger, they have had some initial conversations with the Runanga and heard that their focus was on the consenting process for the time being, they have also done their own catchment plan and are hoping agencies would come in to be part of this in time. Brad's focus currently in more on the Rangatata River, it's intended that the Waitaki Nga Awa work will develop more over coming years, alongside Jwi.

Thanks, Nicki

From: Richard Maloney <rmaloney@doc.govt.nz>

Sent: Wednesday, 1 Jun 2022 12:21 pm **To:** Ken Hughey < khughey@doc.govt.nz>

Cc: Dean Nelson <dnel on@doc.govt.nz>; Nicki Atkinson <natkinson@doc.govt.nz>; Colin O'Donnell <CODONNELL@doc.govt.nz>; Hughey, Kenneth 9(2) (a) Karina

Morrow < kmorrow@doc.govt.nz>; Herb Familton < hfamilton@doc.govt.nz>

Subject: FW: Ken's view of the world - 30 May 2022

Hi Ken

Wasn't sure if you actually wanted a response to this, so I haven't commented on your text. I have had a look at the \$\$ contributions you have listed – its not clear yet what this list is supposed to represent with regard to combinations of current, ongoing, regular costs, but it does seem to be missing a number of relevant things.

Therefore, I have taken your list, and put it into excel, and have added the most obvious gaps (still needs to add int the ones that you may get from Nicki and others in Bio Gp via your request). There are some missing values that it would be useful for you and Dean to collate to complete this.

Hope that helps.

Cheers

From: Ken Hughey < khughey@doc.govt.nz >

Sent: Tuesday, 31 May 2022 11:21 am

To: Dean Nelson <<u>dnelson@doc.govt.nz</u>>; Nicki Atkinson <<u>natkinson@doc.govt.nz</u>>; Colin O'Donnell < CODONNELL@doc.govt.nz >; Richard Maloney < rmaloney@doc.govt.nz >

Cc: Adrian Gilby <agilby@doc.govt.nz>; Aaron McKay <aamckay@doc.govt.nz>; Hughey, Kenneth

Subject: Ken's view of the world - 30 May 2022

eant to op on Thursday, of the circle of the Hi Team – please find attached a think piece as a starter for Thursday. This is not meant to be the

Note I will not be at tomorrow's catch up meeting, and that after our workshop on Thursday Lam

Weeds	Work river weed work J4N funded via	Per annum \$800 000	O CONTRACTOR OF THE CONTRACTOR
Rabbits	DOC rabbit control in Tekapo Ohau Pukaki Tasman Ahuriri Godley riverbeds		u O Dean can you check total ha and frequency Costs are \$150/ha (aerial 1080) over about 20000 ha = \$3m lets say every 5 years = \$600k per annum
Species mgmt Research and management Research and management	Doc kaki programme DOC Uni Predator fence insects DOC/Uni River dynamics research Cass	\$ 0 000 \$ 0 000 \$ 1 0 000	0 \$1 0 000 one-off was recent fence bu ld
Research and management	DOC/Uni/PRR black fronted tern movements research	\$80 000	_
Research and management Research and management	DOC/PRR River terr invertebrate sampling DOC grasshopper and weta field and advice	\$40 000 \$20 000	0 Excludes \$10k PRR
Monitoring	PRR grasshopper annual surveys DOC/PRR Tu Te Rakiwhanoa Mackenzie rivers	\$1	
Research and management	invertebrate refence collection work	\$20 000	0 Excludes \$10k PRR
Research and management	DOC hedgehog impacts on invertebrate/lizard research	\$60 000	
Weeds Species mgmt	Weeds and river works operation budget? DOC fish weirs	\$178 000 Dean	U Company of the Comp
Monitoring	Other costs from TSU FW Threats Bio teams	Ken Ken requested	
	DOC/farmer River fence maintainence - Tekapo Pukaki Ohau	?	
PRR weeds and predator PRR weeds and predator	Meridian via PRR Genesis via PRR	Dean Dean	This is the PRR work This is the PRR work
What is this work Ken? What is this work Ken?	Meridian with Genesis with	Ken Ken	
	DOC tenure review wetland and riverbed puchases		
Geraldine Ops	(eg Cass Ahuriri riverbeds Mt Gerald wetland)		\$3mill-\$7.5 mill I haven't calculated this but it will be at least this much
	Lower waitaki weed work ops team	70001	
Freshwater work	Lower Waltaki ops budget for nga awa work going forward	90001	
Reseach and management	Nga Awa Waitaki river restoration report with costings Nga Awa Waitaki R land encroachment study (from		50000
	2019/20)		60000 couple of years ago but still a very relevant piece of work/cost
Reseach and management	Nga Awa staff time: 0.5FTE Snr Ranger 0.3FTE C Band and 0.2FTE Tech Advisor	00000	
	Nga Awa work on sediment movment in Rangitat - applicable to a l braided rivers pro rated (1/4th)		25000 work that will support nga awa restoration at Waitaki and other rivers. Total cost was \$ 00k. Proportione as 1 of the doc regions work is applicable
Reseach and management	Migatory Fish programme - guidance on Inanga monitoring pro rata (1/9th)		2000 work that will support nga awa restoration at Waltaki and other rivers. Total cost was \$20k. Prop. th. d as total doc regions work is applicable to
Reseach and management	Migatory Fish programme - kanakana larval fishing methods pro rata (1/9th)		2000 work that will support nga awa restoration at Waitaki and other rivers. Total cost was \$15k, ro trioned as out of 9 doc regions work is applicable to
Reseach and management	Migratory fish programme - glass eel reseach work pro rata (1/9th)		3000 work that will support nga awa restoration at Waitaki and other rivers. Total cost \$30k. P portioned 1 out of 9 doc regions work is applicable too
Reseach and management	Migatory fish programme - NIWA report on eel trap and transfer pro rata (1/7th)		3000 work that will support nga awa restoration at Waltaki and other rivers. Total costs. 0k Proport, ned as 1 out of 7 doc regions work is applicable too
-	CRESP programme - reduced flow scenarios with trout and		
Reseach and management	non migratory glaxias reseach pro rata (1/2) Freshwater Biosecurity programme support to check clean		30000 work that will support nga awa restoration at Waitaki and other rivers. Total cost 10k Proportioned as 1 out of 2 doc regions work is applicable too
Reseach and management	dry - pro rata (1/9th)	6001	0 work that will support nga awa restoration at Waitaki and oth livers. Losst 50k Proportioned as 1 out of 9 doc regions work is applicable too
TSU Reseach and management	Technical Support for Waitaki River (Colin etc)	15000	
Reseach and management	Technical Support for Waitaki River (Colin etc) Woody vegetation restoration on Eastern South Island limestone*	3000	
	Control and influence of invasive swarding grasses on		
Reseach and management	native plant* Rare calcicolous plant propagation and translocation; and	7001	
Reseach and management Reseach and management	Po linators of rare calcicolous plants: diversity and efficiency* Threatened Plant Monitoring in the Waitaki*	1000	
			()
		8	
		9	
	NU.	9	
	JUC	9	
	971	9,	
	eg ni	9	
	egni	9	
	sedun	0	
	sedur	9,	
	sedur	9,	
	sedur	9,	
0,0	sedur	9,	
60	sedur	9,	
60	sedur	9,	
3/6.0	sedur	0,	
3/63	sedur	0,	
3/63	sedur	9,	
3/63	sedur	9,	
3/63	sedur	9,	
3/6.0	sedur	0,	
3/6.0	sedur	0,	
3/63	sedur	0,	
3/6.0	sedur	O'	
3/63	sedui	0,	
3100	sedui	0,	
3/6/2	sedur	0,	

Project name Lower Waitaki River Catchment Conservation and Restoration

DOC contacts Marine Richardson (mricharson@doc.govt.nz)

Rosemary Miller (rmiller@doc.govt.nz)

Alexander Macdonald (alemacdonald@doc.govt.nz)

Brad Edwards (bedwards@doc.govt.nz)

Contractor Instream Consulting Ltd

Contractor contacts Greg Burrell (gburrell@instream.co.nz)

Clinton Webb (cwebb@instream.co.nz)

21311 28-Feb. 28-Feb. Official Information Official 21310201

Methods The Restoration Matrix was produced by Instream, and it supports a report of conservation values, pressures, and restoration opportunities in the Lower Waitaki River catchment.

> Costed items reflect restoration actions identified as priorities following a literature review, interviews with people from various agencies, and a costing workshop held between Instream and DOC on 28 January 2022.

The scope included providing rough, order of magnitude cost estimates for priority restoration activities.

Items were costed by contacting experts with relevant experience, suppliers, and using our expert opinions. To produce these costings, a variety of assumptions were made. These are listed against each line item.

eleased under Official Intornation For items including staff time, consultants were costed at \$120/hr, and DOC staff at \$33/ hr (maximum C Band ranger rate).

2 eleased under the second sec			.,	·
a leased under the second of t	:			
eleased under Official Contract of the contrac				
eleased under				
eleased under	•			
eleased under		•		· · · · · · · · · · · · · · · · · · ·
eleased under		•		
eleased under	:			· · · · · · · · · · · · · · · · · · ·
eleased under the second secon			: :	· · · · · · · · · · · · · · · · · · ·
eleased linder				
		•		
				The state of the s
	•			
				· · · · · · · · · · · · · · · · · · ·
eleased inder				
eleased under	:	• :	# T	
eleased under				A Committee of the Comm
eleased under				
eleased under Officer				
eleased linder			E 15	
eleased under		X		- · ·
eleasedunder				
eleased.undel				
eleased unde				
eleasedunio		X		
eleased III				
eleased				
	G			
	10,0			
	O.			

From: Clinton Webb

To: <u>Brad Edwards; Marine Richarson; Rosemary Miller; Alexander Macdonald</u>

Cc: <u>DLVC_INSTREAM_CONSULTING_LTD</u>

Subject: Lower Waitaki River Conservation and Restoration - Draft Report

Date: Monday, 28 February 2022 1:29:30 pm

Attachments: Instream.2022.Lower Waitaki Restoration Costing.xlsx

Instream.2022.Lower Waitaki.docx Instream.2022.Lower Waitaki.pdf

Hi all,

Please find our attached draft report and restoration matrix.

The restoration costings are complete, except we are still waiting on a price estimate for the bird tracking tags. That means there is still some uncertainty around the cost of the bird meta-population study. I have followed up and will update as soon as I get the information.

Thank you for the opportunity to be involved with this highly rewarding project. We look forward to hearing your feedback.

Ngā mihi nui, Clinton

zeleased under l

Clinton Webb | Freshwater Ecologist | Instream Consulting Limited 314 Tuam Street, PO Box 1200, Christchurch 8140, New Zealand T: 9 (2) (a) | E: cwebb@instream.co.nz | www.instream.co.nz

Please note that this email message may contain confidential information subject to legal privilege and intended solely for the intended recipient. If you are not the intended recipient of this message, please notify the sender and delete any copies. No guarantee or warrantee is given for advice provided in this transmission.

From: Dean Nelson

To: Ken Hughey; Susan Newell

Subject: RE: Waitaki HEP Bottom Line - DOC-7031836 (2) IN-CONFIDENCE

Date: Wednesday, 1 June 2022 4:41:48 pm

Hi Ken and Susan,

Just checking your bottom-line figure – we are receiving nearly \$586k per annum, CPI adjusted each year. Is that the figure you need to be using?

Cheers, Dean

From: Ken Hughey < khughey@doc.govt.nz> Sent: Wednesday, 1 June 2022 4:28 pm

To: Dean Nelson <dnelson@doc.govt.nz>; Colin O'Donnell <CODONNELL@doc.govt.nz>; Nicki

Atkinson <natkinson@doc.govt.nz>; Richard Maloney <rmaloney@doc.govt.nz>

Cc: Adrian Gilby <agilby@doc.govt.nz>

Subject: Fwd: Waitaki HEP Bottom Line - DOC-7031836 (2) IN-CONFIDENCE

Dear all. I received the attached, counter factual, from Susan and Herb this pm. This is provided on a priveleged, in- confidence basis, as additional context for tomorrow.

Thanks Ken

Sent from Workspace ONE Boxer

----- Forwarded message ------



I	Mon	Tues	Wed	Thurs	Fri
J	~	√	✓	√	√

Caution - This message and accompanying data may contain information that is confidential or

subject to legal privilege. If you are not the intended recipient you are notified that any use, dissemination, distribution or copying of this message or data is prohibited. If you received this email in error, please notify us immediately and erase all copies of the message and attachments. We apologise for the inconvenience. Thank you.

From: Susan Newel

To: Ken Hughey; Karina Morrow
Cc: Herb Familton; Jo Macpherson

Subject: RE: Waitaki HEP Bottom Line - DOC-7031836 (2)

Date: Wednesday, 1 June 2022 3:38:50 pm

Yes that's fine, as long as it is kept internal to DOC, to maintain privilege.

From: Ken Hughey < khughey@doc.govt.nz> Sent: Wednesday, 1 June 2022 3:34 pm

To: Susan Newell <snewell@doc.govt.nz>; Karina Morrow <kmorrow@doc.govt.nz>

Cc: Herb Familton hfamilton@doc.govt.nz; Jo Macpherson jmacpherson@doc.govt.nz

Subject: RE: Waitaki HEP Bottom Line - DOC-7031836 (2)

Susan and Herb

A huge thanks to you both – think I owe you!!!

Would it be OK with you both if I shared this with the science group meeting tomorrow morning

as additional context?

Ken



Mon		Tues	Wed	Thurs	Fri
V	,	✓	✓	✓	✓

Caution - This message and accompanying data may contain information that is confidential or

subject to 1 gal privilege. If you are not the intended recipient you are notified that any use, dissemination, distribution or copying of this message or data is prohibited. If you received this email in error, please notify us immediately and erase all copies of the message and attachments. We apologise for the inconvenience. Thank you.

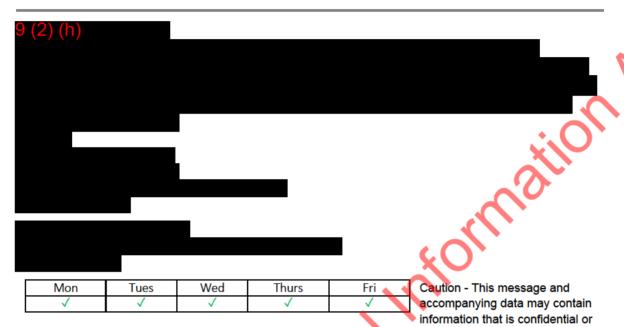
From: Susan Newell

To: Ken Hughey; Karina Morrow

Cc: Herb Familton

Subject: Waitaki HEP Bottom Line - DOC-7031836 (2)
Date: Wednesday, 1 June 2022 3:24:08 pm

Attachments: Waitaki HEP Bottom Line - DOC-7031836 (2).docx



subject to legal privilege. If you are not the intended recipient you are notified that any use, dissemination, distribution or copying of this message or data is prohibited. If you received this email in error, please notify us immediately and erase all copies of the message and attachments. We apologise for the inconvenience. Thank you.

From: Richard Maloney
To: Ken Hughey

Cc: Dean Nelson; Nicki Atkinson; Colin O"Donnell; Hughey, Kenneth; Karina Morrow; Herb Familton

Subject: FW: Ken"s view of the world - 30 May 2022

Date: Wednesday, 1 June 2022 12:21:29 pm

Attachments: Ken"s view of the world - 30 May 2022.docx

Approximate current costs Waitaki catchment June 2022,xlsx

Hi Ken

Wasn't sure if you actually wanted a response to this, so I haven't commented on your text. I have had a look at the \$\$ contributions you have listed – its not clear yet what this list is supposed to represent with regard to combinations of current, ongoing, regular costs, but it does seem to be missing a number of relevant things.

Therefore, I have taken your list, and put it into excel, and have added the most obvious gaps (still needs to add int the ones that you may get from Nicki and others in Bio Gp via your request). There are some missing values that it would be useful for you and Dean to collate to complete this.

Hope that helps.

Cheers

Richard

From: Ken Hughey < khughey@doc.govt.nz>

Sent: Tuesday, 31 May 2022 11:21 am

To: Dean Nelson dnelson@doc.govt.nz; Nicki Atkinson natkinson@doc.govt.nz; Colin O'Donnell <CODONNELL@doc.govt.nz>; Richard Maloney mailto:natkinson@doc.govt.nz; Richard Maloney natkinson@doc.govt.nz; Richard natkinson@doc.govt.nz; Richard natkinson@doc.govt.nz; Richard natkinson@doc.govt.nz; Richard natkinson@

Cc: Adrian Gilby <agilby@doc.govt.nz>; Aaron McKay <aamckay@doc.govt.nz>; Hughey, Kenneth

Subject: Ken's view of the world - 30 May 2022

Hi Team – please find attached a think piece as a starter for Thursday. This is not meant to be the definitive view of the world, but hopefully something to respond to.

Note I will not be at tomorrow's catch up meeting, and that after our workshop on Thursday I am heading off to meet with the 3 papatipu runanga at 1pm

Thanks and looking forward to Thursday morning.

Ken



Kia ora everyone – my brain is hurting! Just some of Ken's thoughts as a starter for Thursday

Reminder context:

- The two generators and DOC are working over a roughly 2-month time period (and it will be
 a bit longer, hopefully) to determine whether a side agreement to the Waitaki HEP resource
 consenting process can be achieved.
- Together we have agreed that "The parties (the Department of Conservation, Meridian Energy and Genesis Energy) will work towards an agreement ... that will achieve ecologically [and culturally] enduring biodiversity conservation outcomes. This is in response to the ongoing ecological effects of the operation of the Waitaki Power Scheme and Tekapo Power Scheme that will exceed any likely outcome from the resource consenting process (including the Environment Court)."

In a nutshell, and reflecting on some earlier work I was not a party to:

- From the start of my involvement, I have been focused on outcomes, and that is how we have built the negotiation process with the 2 companies. This is the form follows function approach, which differs to the earlier approach which seemed to me to be largely about the money. Acknowledging the latter, it has always been clear to me that we are not going to, in reality, get \$18m per annum from the generators that some think we should, either through negotiation or through the consenting process BUT IF YOU DISAGREE, PLEASE TELL ME! Further even arguing for such in a negotiation would be counter-productive.
- Indeed, from an incoming resource perspective I have real doubts we will get to \$4m per annum (which was the first bottom line I saw), but hopefully I am wrong?
- What the above means is that with the current offer of around \$1.2-1 3m pa, and our biodiversity outcome scenarios being \$3, 5 and 10m operating per annum, then it is likely we will struggle to get to even the \$3m pa but I don't know ye and I have my fingers crossed. So, the question then is what is our absolute outcome and resource bottom line, that if we achieved would still be good for biodiversity and still e __eed whatever we might realistically expect from going through the consenting process?
- Related to the above is another issue. For some time I have painted a picture, which the
 generators have painted also to me, that we want to understand what we are investing and
 what others also are investing currently. They see their investment (while still called
 mitigation) as being a part of the bigger picture, and so do I (and my reasoning is partly
 explained below). This is a really important issue we need to work through and understand.

Some more context:

- The Waitaki power scheme that we know today was begun with the commissioning of Lake Waitaki in 1934 it effectively split the river in two and halted upstream fish migration which has been hugely detrimental to long-finned tuna in particular, but likely also for other native fish. It has had other ecological consequences which we are reasonably clear about.
- But even then, in 1934, and we do have some direct evidence and relevant comparative information from othe rivers like the Rakaia (e.g., have a read of Stead's 1932 classic 'The life history of NZ bi ds'), human induced pressures were already occurring and having an impact on ey na ive bird species, e.g., woody weeds (especially lupin) were becoming well established and some mammalian predators were invading habitats and already destroying whole bird colonies. THUS, <u>WITHOUT</u> THE HYDRO DEVELOPMENT THE WAITAKI WAS ALREADY HEADING DOWN A SIMILAR PATHWAY TO OTHER BRAIDED RIVERS AND SPECIES LIK BLACK STILT WOULD LIKELY BE NATIONALLY CRITICAL EVEN WITHOUT THE SCHEME. H ving said this Lake Waitaki and the other dams (Aviemore and Benmore) also drowned wetlands and other habitats these are lost forever. And they have forever changed the

flow and sediment regime of the lower Waitaki – it is now much more stable, and the woody weed problem is hugely worse, as to is predation from a variety of sources.

- But, the much more recent developments in the upper catchment: the canals, the managed lake levels of Pukaki and Tekapo, and the river (Tekapo, Pukaki and Ohau) diversions, have greatly increased the direct impacts woody weed spread on the Tekapo, large no flow reaches along the Tekapo, Ohau and Pukaki rivers, and significant lake level fluctuations especially for Pukaki and Tekapo, have together hugely reduced habitat availability and quality and have greatly increased predation of birds and terrestrial insects and lizards. And there are impacts on species and habitats caused by the canals which directly impact on connectivity.
- With all of this context then we can build two pictures: the <u>WITHOUT HEP</u> picture, and the <u>WITH HEP</u> picture given the above and DOC's biodiversity conservation mandate it is clear that even WITHOUT HEP, significant conservation investment would have been required to conserve key species and habitats, <u>but likely hugely less than today</u>.

The WITHOUT HEP biodiversity conservation investment need:

- Woody weed control would be required on the lower Waitaki and also on the Ahuriri and Tekapo. The Ahuriri is suffering without the impact of HEP and the Tekapo, because of the lake, would likely have had a growing woody weed problem needing investment.
- Predator control would still be needed but probably not to the extent required today. The work of many, mostly DOC researchers, demonstrates the importance of river flow in dynamic braided river environments in helping protect birds (and likely also insects and lizards) nesting on islands from mammalian predators. Any flow helps but the higher the flow the larger the extent of protection (O'Donnell's work on black-front ern shows this, indirectly).
- Other habitat protection work, e.g., wetlands, would still be equired be ause farming, including recent intensification, was already a significant pressure on these areas.

The WITH HEP biodiversity conservation investment need

- We need to support the papatipu runanga to continue to grow long-finned tuna recovery in the upper catchment – this is totally within the ambit of WITH HEP and thus should be 100% funded as planned in the scenarios. Most of the other native fish work is linked directly to WITH HEP impacts (e.g., via canal related connectivity issues), but can likely be reduced in discussion with Ngai Tahu.
- The woody weed problem is immense on the lower Waitaki and is very significant on parts of the Tekapo and much worse as a resul of HEP development. My guess, especially given some of the stabilising effects of dams on the lower Waitaki, and of the operating regime applying to the Tekapo, is that tis 2-3x as bad as the WITHOUT HEP situation. Assuming this is the case we can easily calculate the WITH HEP vs WITHOUT HEP COST (and this is seen in the 3 scenarios we have pleased, each reduced by ½ or 1/3rd I prefer the latter). There will be direct benefits for birdlife, lizards and probably terrestrial insects with effective and significant woody and elated weed control.
- The woody weed p oblem is also impacting on neighbouring wetlands along both sides of the lower Waitak and along parts of the lower Ohau and Tekapo I'm not sure how to calculate this but maybe lump it with the above.
- Woody wee s also help drive predation impact, i.e., they harbour prey such as rabbits on islands which are hunted by mammalian predators which also prey on desired native species t e costs of predator control are therefore linked to woody weed control but also to the efects of reduced rivers flows. For the lower river therefore, the cost is the cost as per the scenarios presented. Upstream there would have been predator control for black stilts but probably not to the extent now undertaken and almost certainly less for other species. The

calculation problem here is that loss of habitat (no flows in rivers), etc., has greatly exacerbated need and therefore the predator control planned should be that identified in the scenarios, at least for the Tekapo, Ohau and Tasman, as mitigation for what is now lost. Associated and targeted work on the Ahuriri is complementary and funding should be as per the scenarios.

Habitat loss is significant and of course both direct and indirect. With the loss of river flows there is also other riparian habitat deterioration. A case can be mounted therefore for wetland restoration, especially along the Tekapo river and environs, as envisaged in the scenarios. Most of this investment should come from the generators as most of the loss is directly attributable to the scheme, as envisaged in the scenarios. So, what might an investment look like?

A 'partnership' approach to the mitigation opportunities:

- From the above we can see that even without a hydro scheme, and all other things being roughly equal, we would still be investing significantly into aspects of the Waitaki and its biodiversity. If we add the HEP impacts, then clearly there is a case for a shared approach t the work. And, as noted, the generators are seeing an opportunity to work with others to build the biodiversity conservation opportunity here in a cost-effective way – personally 1 agree with this approach.
- So, based on the above I can envisage an opportunity emerging which looks a bit like:
 - Zone 1: Lower Waitaki Meridian and working together to support DOC achieve significant active riverbed island and riparian wetland gains irds and native fish will gain. DOC invests time while operational costs are covered by other
 - Zone 2: Ahuriri et al Meridian and and DOC par ner o achieve exemplar sites on the lower Ahuriri, with DOC investing in its black stilt and related work. The tuna catch and carry programme is enhanced and benefits a Izon s
 - Zone 3a: Tasman et al Meridian and DOC work together as per now on the Tasman, but with some additional work around the lake

 - Zone 3b: Pukaki, Ohau et al Meridian wor's with DOC on exemplar sites
 Zone 4: Tekapo catchment Genesis and partner with DOC partner with DOC for Tekapo and related woody weed control, while Genesis and DOC work on native fish and predator control, and also on ip ria wetland protection especially in the Grays
 - Overall ongoing applied research to fil knowledge gaps and improve delivery cost effectiveness.

The sum of current investments, roughly speaking, in 2021-22, is in the order of (noting I am still firming up on this):

- \$750800k, mostly in the TMA area but linked to rivers and weeds
- DOC rabbit control in Tekapo, Ohau, Pukaki, Tasman, Ahuriri, Godley riverbeds
- DOC \$??? pa large y for the kaki programme
 DOC/TMA/Uni robus grasshopper/Tekapo weta \$130k fence \$10k
- DOC/Universities/ braided river (Holly=\$10k BRI) research in Mackenzie (Bfterns,Ca s and Tasman River \$42k incl \$10prr, Invertebrates) = ~\$300k including Uni inkind and scholarship contributions
- Tekapo weta 10% Tara
- Gras hopper surveys 10% Tara
 - MSc per annum Tara
- sman invert ref collection PRR Tu Te Rakiwhanoa \$20k per annum
- 66% of outcome monitoring hedgehogs
- 33% trapping sites hedgehogs

- this is just the weeds and river works budget? \$178k pa
- fish weirs / wetland protection fencing
 - nutrient monitoring in Mackenzie Rivers
- Meridian (via PRR) = \$600k pa and with
- Genesis (with == ??? and via PRR = \$150k pa
- Shouldn't we be including the crown tenure review costs for land purchase for wetlands and riverbed areas in the Mackenzie (eg Cass River from Godley Peaks, Upper Ahuriri River, Mt Gerald Wetland) - this would something like \$1500ha x ?2000-5000+ha = min of \$3-\$7.5mill

Here's a more complete table - I've attached it to the email

t	his is just the weeds and river v	works budget? - \$178k r	va .
	ish weirs / wetland protection		
	nutrient monitoring in Mackenz		
	n (via <u>PRR) </u> = \$600k pa and with		
Genesis	(with == ??? and via PRR =	\$150k pa	
- Shouldn	't we be including the cro	wn tenure review costs	for land purchase for wetlands
	rbed areas in the Mackenzie (e		
	<u>ld Wetland) – this would some</u>	tning like \$1500na x ?20	100-5000+na = min of \$3-
<u>\$7.5mill</u>			
Here's a more co	omplete table – ľve attached i	t to the email	
	· · · · · · · · · · · · · · · · · · ·		
Work type		Per annum Significant recent one-offs	Notes
Weeds	river weed work J4N funded via TMA	\$800 000	To the second form the feet delication and the second seco
Rabbits Species mgmt	DOC rabbit control in Tekapo Ohau Pukaki Tas	5600 000 Dean can you check total ha	
		Dean	anc Costs are \$150/ha (aerial 1080) over about 20000 ha
Research and management	Doc kaki programme DOC/TMA/Uni Predator fence insects	Dean \$10 000 \$130	anc Costs are \$150/na (aeriai 1080) over about 20000 ns 000 one-off was recent fence build
	and the second		
Research and management	DOC/TMA/Uni Predator fence insects	\$10 000 \$130 \$110 000	000 one-off was recent fence build
Research and management Research and management	DOC/TIMA/Uni Predator fence insects DOC/Uni, River dynamics research Cass	\$10 000 \$130 \$110 000 \$80 000 \$40 000	000 one-off was recent fence build includes \$10k DOC support University in-life includes \$20k PRR Excludes \$10k PRR
Research and management Research and management Research and management	DOC/TMA/Uni Predator fence insects DOC/Uni River dynamics research Cass DOC/Uni/PRR black fronted term movements research	\$10 000 \$130 \$110 000 \$80 000 \$40 000 \$20 000	000 one-off was recent fence build includes \$10k DOC support University in-\(\) d : Excludes \$20k PRR
Research and management Research and management Research and management Research and management Monitoring	DOC/TMA/Uni Predator fence insects DOC/Uni Rever dynamics research Cass DOC/Uni/PRR black fronted term movements research DOC/PRR River terr invertebrate sampling DOC grasshopper and weta field and advice PRR grasshopper annual surveys	\$10 000 \$130 \$110 000 \$80 000 \$40 000 \$20 000 \$0	000 one-off was recent fence build includes \$100 DC support University in-k d : Excludes \$20k PRR Excludes \$10k PRR TSU time R Line Below
Research and management Research and management Research and management Research and management Research and management Monitoring Research and management	DOC/TMA/Uni Predator fence insects DOC/Uni River dynamics research Cass DOC/Uni/PRB black fronted term movements research DOC/PRR River terr invertebrate sampling DOC grasshopper and weta field and advice PRR grasshopper annual surveys DOC/PRR Tu Te Raidwhanoa Mackenzie rivers in	\$10 000 \$130 \$110 000 \$80 000 \$40 000 \$20 000 \$0 \$20 000	000 one-off was recent fence build includes \$300 PDC support. University in-occupied Excludes \$200 PRR Excludes \$400 PRR TSU time Costs in PRR line below Excludes \$100 PRR
Research and management Research and management Research and management Research and management Monitoring Research and management Research and management	DOC/TIMA/Uni Predator fence insects DOC/Uni Rever dynamics research Cass DOC/Uni/PRR black fronted term movements research DOC/PRR River terr invertebrate sampling DOC grasshooper and weta field and advice PRR grasshopper annual surveys DOC/PRR Tu Te Rabinhanoa Mackenzie rivers is DOC hedgehog impacts on invertebrate/lizard resear	\$10 000 \$130 \$110 000 \$80 000 \$40 000 \$20 000 \$50 \$20 000 \$50 000 \$60 000	000 one-off was recent fence build includes \$100 DC support University in-k d : Excludes \$20k PRR Excludes \$10k PRR TSU time R Line Below
Research and management Research and management Research and management Research and management Monitoring Research and management Research and management	DOC/TMA/Uni Predator fence insects DOC/Uni Rever dynamics research Cass DOC/Uni/PRR black fronted term movements research DOC/Uni/PRR black fronted term movements research DOC/PRR River terr invertebrate sampling DOC grasshopper annual surveys DOC/PRR Tur Te Rakiwhanoa Mackenzie rivers in DOC/PRR Uniformatical Company of the Company o	\$10 000 \$130 \$110 000 \$80 000 \$40 000 \$20 000 \$0 \$20 000 \$60 000 \$178 000	000 one-off was recent fence build includes \$300 PDC support. University in-occupied Excludes \$200 PRR Excludes \$400 PRR TSU time Costs in PRR line below Excludes \$100 PRR
Research and management Research and management Research and management Research and management Monitoring Research and management Research and management Weeds Species mgmt	DOC/TMA/Uni Predator fence insects DOC/Uni Rever dynamics research Cass DOC/Uni PRR black fronted term movements research DOC/Uni/PRR black fronted term movements research DOC/PRR River terr invertebrate sampling DOC grasshooper and weat field and advice PRR grasshooper and west field and advice PRR grasshooper and surveys DOC/PRR Tu Te Rabitwanou Mackenzie rivers in DOC hedgehog impacts on invertebrate/lizard resear Weeds and river works operation budget? DOC ## Sish weirs	\$10 000 \$130 \$110 000 \$80 000 \$40 000 \$20 000 \$20 000 \$50 000 \$60 000 \$178 000 Dean	000 one-off was recent fence build includes \$300 PDC support. University in-occupied Excludes \$200 PRR Excludes \$400 PRR TSU time Costs in PRR line below Excludes \$100 PRR
Research and management Research and management Research and management Research and management Monitoring Research and management Research and management Weeds	DOC/TIM4/Uni Predator fence insects DOC/Uni—Rever dynamics research Cass DOC/Uni—Rever dynamics research Cass DOC/Uni—Rever dynamics research DOC/PRR River terr invertebrate sampling DOC grasshopper and weta field and advice PRR grasshopper annual surveys DOC/PRR Tu Te Rakiwhanoa Mackentie rivers is DOC/PRR Tu Te Rakiwhanoa Mackentie rivers in DOC hedgehog impacts on invertebrater/lizard resear Weeds and river works operation budget? DOC Tisk wells Instrument river monitoring	\$10 000 \$130 \$110 000 \$80 000 \$40 000 \$20 000 \$0 \$20 000 \$60 000 \$178 000 Dean	000 one-off was recent fence build includes \$300 PDC support. University in-occupied Excludes \$200 PRR Excludes \$400 PRR TSU time Costs in PRR line below Excludes \$100 PRR
Research and management Research and management Research and management Research and management Monitoring Research and management Research and management Weeds Species mgmt	DOC/TMA/Uni Predator fence insects DOC/Uni PR black fronted term movements research DOC/Uni/PRR black fronted term movements research DOC/PRR River terr invertebrate sampling DOC grasshopper and weat field and advice PRR grasshopper and user field and advice PRR grasshopper and user field and advice DOC/PRR Tiver terr inverse in the state of	\$10 000 \$130 \$110 000 \$10 000 \$40 000 \$40 000 \$50 000 \$50 000 \$50 000 \$50 000 \$718 000 Dean Ken requested	000 one-off was recent fence build includes \$300 PDC support. University in-occupied Excludes \$200 PRR Excludes \$400 PRR TSU time Costs in PRR line below Excludes \$100 PRR
Research and management Research and management Research and management Monitoring Research and management Monitoring Research and management Weeds Species mgmt Monitoring	DOC/TIM4/Uni Predator fence insects DOC/Uni—Rever dynamics research Cass DOC/Uni—Rever dynamics research Cass DOC/Uni—Rev dynamics research Cass DOC/PRR River terr invertebrate sampling DOC grasshooper and weat field and advice PRR grasshopper annual surveys DOC/PRR Tu Te Radivhanoa Mackenzie rivers is DOC hedgehog impacts on invertebrate/lizard resear Weeds and river works operation budget? DOC Tash weirs nutrinent river monitoring Other costs from TSU FW Threats Bio teams DOC/Grame River fence maintainence - Tekapo	\$10 000 \$130 \$110 000 \$510 000 \$60 000 \$40 000 \$20 000 \$50 \$20 000 \$60 000 \$178 000 Dean Ken requested 7	000 one-off was recent fence build includes \$100 DC support. University in-t. d. Excludes \$200 PRit. Excludes \$200 PRit. TSU time. Costs in PRR line below. Excludes \$100 PRR Calculated as 40% of total project on a (4 or lites findicated as 40% of total project on a (4 or lites
Research and management Research and management Research and management Research and management Monitoring Research and management Weeds Species mignt Monitoring PRR weeds and predator	DOC/TMA/Uni Predator fence insects DOC/Uni Reventy enhances research Cass DOC/Uni PRR black fronted term movements research DOC/PRR Block fronted term movements research DOC/PRR River terr invertebrate sampling DOC grasshopper and weta field and advice PRR grasshopper annual surveys DOC/PRR Tu Te Rakiwhanoa Mackenzle rivers is DOC hedgehog impacts on invertebrate/fixtrad resear Weeds and river works operation budget? DOC Tish weirs nutrinent river monitoring Other costs from TSU FWThreats Bio teams DOC/farmer River fence maintainence - Tekapo Meridian via PRR	\$10 000 \$130 \$110 000 \$80 000 \$40 000 \$20 000 \$20 000 \$50 \$50 \$50 000 \$178 000 Dean Ken requested ? 7 Dean	000 one-off was recent fence build includes \$100 To Support University in-to-discrete \$200 PRR Excludes \$200 PRR Excludes \$100 PRR Includes \$100 PRR Include
Research and management Research and management Research and management Research and management Monitoring Research and management Weeds Species mgmt Monitoring PRR weeds and predator PRR weeds and predator	DOC/TIMA/Uni Predator fence insects DOC/Uni Revent dynamics research Cass DOC/Uni PRR black fronted term movements research DOC/PRR River terr invertebrate sampling DOC arcashooper and weat field and advice PRR grasshooper and surveys DOC/PRR III To Te Rakiwhanoa Mackenzle rivers is DOC/PRR III To Te Rakiwhanoa Mackenzle rivers is DOC bedgehog impacts on invertebrate/lizard resear Weeds and river works operation budget? DOC III Sha weirs III To Te Rakiwhanoa Mackenzle rivers is DOC for corts from TSU FW Threats Bio teams DOC/farmer River fence maintainence - Tekapo Meridian via PRR Genesis via PRR	\$10 000 \$130 \$110 000 \$10 000 \$80 000 \$40 000 \$20 000 \$20 000 \$20 000 \$178 000 Dean Ken Ken requested ? Dean	000 one-off was recent fence build includes \$100 DC support. University in-t. d. Excludes \$200 PRit. Excludes \$200 PRit. TSU time. Costs in PRR line below. Excludes \$100 PRR Calculated as 40% of total project on a (4 or lites findicated as 40% of total project on a (4 or lites
Research and management Research and management Research and management Research and management Monitoring Research and management Weeds Species mgmt Monitoring PRR weeds and predator	DOC/TIM4/Uni Predator fence insects DOC/Uni—Rever dynamics research Cass DOC/Uni—Rever dynamics research Cass DOC/Uni—Rever dynamics research DOC/PRR River terr invertebrate sampling DOC grasshopper and weta field and advice PRR grasshopper annual surveys DOC/PRR Tu Te Rakiwhanoa Mackenzle rivers is DOC hedgehog impacts on invertebrate/fusard resear Weeds and river works operation budget? DOC fish weirs Inutrinent river monitoring Other costs from TSU FWT hreats Bio teams DOC/Gramer Riliver fence maintainence - Tekapo Meridian via PRR Genesis via PRR Meridian with	\$10 000 \$130 \$110 000 \$80 000 \$40 000 \$20 000 \$20 000 \$50 \$50 \$50 000 \$178 000 Dean Ken requested ? 7 Dean	000 one-off was recent fence build includes \$100 To Support University in-to-discrete \$200 PRR Excludes \$200 PRR Excludes \$100 PRR Includes \$100 PRR Include

ared to We can use this investment, and 'perceived' outcomes, as a starting point to assess against the realistic desired outcomes and investment required to achie e these - this is work for the

Commented [RM1]: Three things to consider

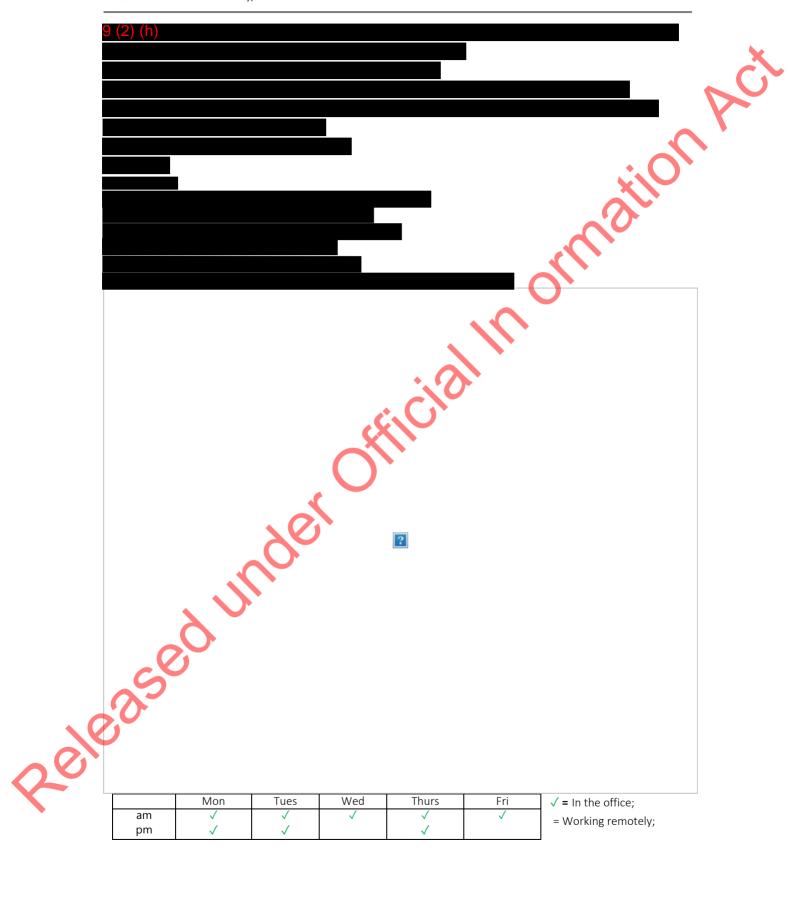
- 1. Past investment as been spiky, so it may be more useful to look at longer-term contributions
- 2.Current investment is not necessarily an indication of the required investment to achieve outcomes (eg Tekapo river weed control is no sufficient at present)
- 3. We have chosen to invest in other rivers away from the Mackenzie because PRR exists and was funding work (e g.,

From: Herb Familton

To: <u>Ken Hughey</u>; <u>Karina Morrow</u>

Subject: Waitaki Paper

Date: Wednesday, 1 June 2022 11:41:21 am



From:

Ken Hughey; Karina Morrow To: Jo Macpherson; Richard Maloney Cc: Subject: weed costs in PRR area Date: Monday, 23 May 2022 2:58:10 pm

Attachments: weed control that relates to PRR area.xlsx

Hi Ken.

As a beginning, I have managed to get my hands on most of the invoices for weed control in the areas traditionally covered by PRR. I have excluded any sites and species that are specific, and it includes some stream/river sites with (in particular) lupins and broom that are seed sources leading into other key rivers and lakes. Note that 2270 are running out of funds for weed control so PRR will pick up most of the rest of the work to be done (see last row in spreadsheet) and there maybe another \$60k to be spent in these areas before the end of EY. Obviously, this is more than what PRR used to spend on weed control in these areas, but it illustrates what needs to be spent to get on top of the weed problem. Obviously also at this stage, it doesn't include PRR, DOC, 9 (2) (j) funded weed control in other areas but I will collate what I can for those. Just thought it was interesting to see what is getting spent in those upper catchments. This is just weed control and doesn't include anything e.se, particularly Leleased under Official predator control.

Date Description 13/05/2022 Lupin control Who paid (excl GST) Upper Fork Stream Contractor ground spray 1,738.00 27/04/2022 Lupin and broom Lower Fork Stream Contractor ground spray 1.961.00 3/05/2022 Lupin control 8/05/2022 Willow control Contractor ground spray Contractor chainsaw Lake Pukaki eastern side 9 666 00 Macaulay Rive 2/05/2022 Willow control Lower cass Contractor chainsaw 2.592.00 22/04/2022 Willow control Coal River Contractor chainsaw 962.00 Godley delta/Tasman Coal River 29/03/2022 Willow control - transport crew 8 360 00 10/04/2022 Willow control Contractor chainsaw 16/02/2022 Willow control - transport crews Godley delta Helicopter transport 7,590.00 4/03/2022 Willow control Coal River Contractor chainsaw 34.180.00 19/02/2022 Willow and some broom control 12/02/2022 Willow and some broom control Coal River, Godley and Jollie Coal River and Lake Tekapo Contractor chainsaw and spray Contractor chainsaw and spray 26.251.00 16/01/2022 Weed control Godley delta Aerial spray 10,260.00 Godley delta/Tasman Coal River and Lake Tekapo Fork Stream? 21/01/2022 Willow control - transport crews Helicopter transport 18 342 00 29/01/2022 Willow and some broom control Contractor chainsaw and spray 27,502.00 30/04/2022 Lupin control Aerial spray 5,085 6/05/2022 Lupin control Fork Stream Contractor ground spray 3,237.0 3/05/2022 Lupin control 5/05/2022 Lupin control Fork Stream Contractor ground spray Contractor ground spray 9 666 00 26/04/2022 Lupin control 2,459.00 Fork Stream Contractor ground spray 10/03/2022 weed control and transport crews Tasman delta Aerial spray and transport 9.010.00 Irishman Creek Mt Cook - Hooker flats Contractor ground spray Contractor ground spray 10, 70.00 6,636 00 19/03/2022 Lupin Control 19/03/2022 Lupin Control 18/03/2022 Lupins and willows Cass River/Fork Stream Contractor ground spray 4.222.00 15/03/2022 Lupin control Fork Stream Contractor ground spray 789.00 22/03/2022 Lupin contro 22/03/2022 Lupin contro 22/03/2022 Lupin contro Tasman River Olivia fan Contractor ground spray 1,183.00 1,101.00 Contractor ground spray Mt Cook - Hooker flats 12/03/2022 Lupin Control Contractor ground spray 10.483.00 Contractor ground spray Contractor ground spray 12/03/2022 Lupin Contro Irishman Creek 17.689.00 Fork Stream Lake Pukaki eastern side 11/03/2022 Lupin contro 1,842.00 9,713.00 8/03/2022 Lupin contro Contractor ground spray 4/03/2022 Lupin control Lake Pukaki eastern side Contractor ground spray 21.160.00 4/03/2022 Eupin control 4/03/2022 Lupin control 26/02/2022 Lupin Control 27/02/2022 Lupin control Fork Stream Irishman Creek Tasman River 3 800 00 18,117.00 Contractor ground spray 2,706.00 25/02/2022 Lupin control Fork Stream Contractor ground spray 4.063.00 21/02/2022 Lupin Control 24/02/2022 Lupin control Irishman Creek Tasman River Contractor ground spray 35,370,00 Contractor ground spray 17/02/2022 Lupin control Fork Stream Contractor ground spray 5,284.00 13/02/2022 Lupin Control Irishman Creek Contractor ground spray 14.753.00 12/02/2022 Lupin Control 9/02/2022 Lupin control Contractor ground spray Contractor ground spray 5,587.00 5,148.00 Irishman Creek Fork Stream 30/01/2022 Lupin control Tasman River Contractor ground spray 3.393.00 22/01/2022 Lupin Control Irishman Creek Contractor ground spray Contractor ground spray 43.576.00 9/02/2022 Lupin contro 17/01/2022 Lupin contro 4,636.00 4,164.00 Mistake Creek Mistake Creek, Fork Stream, Godley delta Contractor ground spray 16/12/2021 Lupin control Tasman Contractor ground spray 6.124.00 22/01/2022 Lupin Control 24/01/2022 Lupin, broom and willow control Contractor ground spray Contractor ground spray Irishman Creek 31.858.00 3,540.00 Tasman River 16/01/2022 Lupin, broom and willow control Tasman River Contractor round pray 2,991.00 Contractor ground spr 17/12/2021 Lupin Control Irishman Creek 5.695.00 15/12/2021 Lupin, broom, willow control 16/12/2021 Weed control Tasman, Hooker Jollie delta, Tasman River 6,124.00 21,060.00 Aerial sp ay
Contrac r groun spray 23/12/2021 Lupin, broom and willow control Tasman River 1,348.00 Contractor ground spray Contractor ground spray ntractor ground spray 14/12/2021 Lunin and willow control Tasman River Coal River 5 835 00 14/12/2021 Lupin and willow control 14/12/2021 Lupin Control 2,053.00 22,666.00 Cass River Irishman Creek Contractor ground spray
Contractor ground spray
C ntractor chainsaw and spray 5/12/2021 Lupin Control Irishman Creek, Mt Cook 40,547.00 24/11/2021 Lupin control 30/11/2021 Lupin control Coal River 5 784 00 Whale Stream 18/05/2022 Lupin contro Fork Stream Contractor ground spray 2,202.00 27/04/2022 Lupin control Fork Stream Contractor ground spray 1.961.00 Godley delta, Coal River, Jollie River Godley Hooker rivers Aerial spray
Contractor ground spray 31/03/2022 Weed control 20.570.00 3/04/2022 Weed contro 31/03/2022 Lupin control 4,736.00 Fork Stream Contractor ground spray 4,009.00 25/03/2022 Weed control Fork Stream, Cass River Contractor ground spray 4.357.00 23/03/2022 Lupin control 19/03/2022 Willow control Fork Stream
Coal and Tasman R ers Contractor ground spray
Contractor chainsaw and spray 1,946.00 12,868.00 s M stake Creek 31/03/2022 Weed control Godley, Cass and Tas Aerial spray 14,280.00 9/03/2022 Lupin, alder and willow control Tasman River Contractor ground spray 2.276.00 6/02/2022 Lupin, broom control 6/02/2022 Gorse, broom control 11,795.00 17,183.00 Coal River, Lake kapo Contractor ground spray Coal Rive Contractor ground spray Tasman, Ilie River
Jollie River d Ita
Tasman nd Jollie Rivers
Cal Riv J. Washdyke Stream
Jol River
Jollie Po: 17/01/2022 Chemical 20,811.00 6/01/2022 Lupin, broom, alder and willow control Contractor ground spray Contractor ground spray 2 974 00 30/11/2021 Lupin, broom, alder and willow control 5,844.00 17,460.00 9/12/2021 Weed control Aerial spray 24/11/2021 Gorse, broom, lupin control Contractor ground spray 9,055.00 20,000 26/11/2021 broom control 14/11/2021 Lupin broom control Contractor ground spray Contractor ground spray 6.000.00 4,247.00 Coal and Godley Rivers Contractor chainsaw and spray 14,122.00

845.036.00

Costs of work undertaken in Mackenzie basin 2021-22

From: Richard Maloney
To: Karina Morrow

Cc: <u>Ken Hughey</u>; <u>Dean Nelson</u>

Subject: RE: Waitaki negotiations weekly meeting
Date: Wednesday, 11 May 2022 3:50:30 pm

Importance: High

Hi Karina

I didn't have an invite in my calendar for that one today, so missed it altogether ..sorry about that.

Had a long talk with Ken on Tuesday about next steps. Here's some bullets, and noting this doesn't entirely line up with what Jo said below about what data was required...

- 1. Ken has asked for Lower Waitaki river management costs he will follow up on that.
- 2. We talked about why costs were needed. Meridian and Genesis were interested in seeing what costs others spent, and therefore what contributions they could make, so that the energy company resource could be put elsewhere / supplement this. We disc ssed the following points about this approach:
 - a. This would lead to a potential side agreement on this side agreement (ie we are reliant on others to provide resources that are not tied to the consenting conditions). This is risky and we should avoid this.
 - b. We strongly believe that the conversation is about what values have been impacted by energy company water use, and the package should reflect a fair improvement to those values paid for by the companies regardless of who else is working in the area, or on who may intend to work there in the future. Otherwise, others are subsidising their consented operational impacts.
- 3. Based on (2), at the moment Ken and Lagreed that there is nothing extra we need to do to supply to Ken and yourself until after your next session with the companies which should focus on getting a more realistic offer for resources to deliver on the range of values impacted.
- 4. At some time in the future, it may be that we will need to tally up the total amount of work done in braided rivers, but in that case, we will be suggesting that this includes a much wider look at whose resources have been allocated where an example is that the money hat comes to DOC (~\$250k per annum) into braided river work in Canterbury, has largely been spent outside the Mackenzie, because PRR funds are already covering some of the costs of some work in that area already otherwise they would have contributed funds to Mackenzie questions. This level of prioritisation means we would want to take a very wide look at what other resources should be included.
- 5. If you wanted to get a head start on point (4), then Dean could start to look at the following but again, not seeing an immediate urgency on this:
 - a. Sum of all costs for weed control contributions from and DOC for each zoneeg Tekapo, Twizel, Ohau, Ahuriri etc (not Zone 1, the Lower Waitaki that Ken will do)
 - b. expected total costs annually for next 5 years we will apportion the riverbed area as a % of total area (Richard to get from Simone/Stephen).
 - c. JFN funding for weeds in space, and in Dobson etc
 - d. Wilding pine control broad per ha costs for all of the Mackenzie, on the basis that the river areas would have been increasingly impacted by pine spread (eg in the Pukaki Riverbed)
 - e. Willow control costs outside those that will cover in (c).
 - f. Any non-PRR predator control and habitat management costs (eg kaki, community

trapping areas)

- g. Any and other funds (eg supporting wetland protection and native fish protection in the Waitaki catchment
- h. Any research money and in kind contributions outside of PRR address research gaps related to braided rivers, wetlands, braid plains, and threatened species in these areas (Richard to do this one).
- i. Any other qualifying costs I might have missed?

Happy to discuss any of this further with Dean or you. I think some of this will be hard to get to an accurate level, and I think that ballpark figures will be okay, so long as we are consistent in how we collect these (e.g., as a per annum figure, opex only costs etc).

Cheers

Richard

From: Karina Morrow kmorrow@doc.govt.nzSent: Wednesday, 11 May 2022 2:54 pmTo: Richard Maloney kmorrow@doc.govt.nzSubject: FW: Waitaki negotiations weekly meeting

Importance: High

Hi Richard

Re the below. I've just met with the working group (Dean N and Nicki Atkinson attended) to explain the further work required below. I said I would touch base with you to see if you need anything from them to put the further info together?

Let me know if you need any support to put this together

Karina

From: Jo Macpherson < imacpherson@doc.govt.nz

Sent: Wednesday, 11 May 2022 9:29 am

To: Herb Familton hfamilton@doc.govt.nz; Ken Hughey khughey@doc.govt.nz; Karina Morrow kmorrow@doc.govt.nz; Colin O'Donnell CODONNELL@doc.govt.nz; Dean Nelson dnelson@doc.govt.nz; Susan Newell snewell@doc.govt.nz; Cassie Mealey

<<u>cmealey@doc.govt.nz</u>>; Hughey, Kenneth <<mark>9(2)(a)

Michael Hayward

Alkinson Chatkinson@doc.govt.nz></mark>

<<u>mhayward@doc.govt.nz</u>>, Nicki Atkinson <<u>natkinson@doc.govt.nz</u>>

Cc: Richard Maloney < maloney@doc.govt.nz > **Subject:** Waitaki negot ations weekly meeting

Kia ora

Just letting you know that Ken and I are both unable to attend today's meeting, we both have other commitments which we are unable to get out of, so apoligise for not being there. Karina will take a lead on our behalf.

I have also asked Karina to step in with Ken and be around the negotiation table from now on. I will also be present, however my capacity is now significantly reduced as a result of moving into the Directors role.

As an up-date for you, Ken and Richard and others have been working, really hard to provide a biodiversity enhancement package that we can use in our Waitaki negotiations with the energy companies. We want to thank Richard in particular for his amazing support here. On Thursday last week Ken provided this material to the companies, without the costs, and on Friday we had a very long face-to-face meeting at DOC in Christchurch. Ken led them through the entire package and associated scenarios and presented estimated costs for each. 9 (2) (1)

One thing we are doing is attempting to quantify the nature, including the costs, of existing biodiversity related work on the Waitaki system (including that spent by Released under Official Information Act trying to clarify which work in the package is already being undertaken, e.g., a lot of the 'woody weed' in river work. In order to catch our breath we have agreed not to meet this week but

From: Richard Maloney
To: Ken Hughey

Subject: RE: indirect costs for programme management

Date: Friday, 6 May 2022 2:49:06 pm

Give me a call when you're free. I'd be keen to hear how it went, and what resets we might need.

Sent from Workspace ONE Boxer

On 6/05/2022 2:42 pm, Ken Hughey < khughey@doc.govt.nz > wrote:

9(2)(i)

From: Richard Maloney <rmaloney@doc.govt.nz>

Sent: Friday, 6 May 2022 11:58 am **To:** Ken Hughey < khughey@doc.govt.nz>

Subject: RE: indirect costs for programme management

No costs in scenario 1 because the braid plain has been managed – ie all the islands are done as part of the whole of river mgmt.

(in Waitaki we built some islands in scenario 1 because we thought it would take awhile to achieve clearance for the whole river – different in Tekapo be ause bulldozing is easier and river is smaller...).

Okay? R

From: Ken Hughey < khughey@doc.govt.nz>

Sent: Friday, 6 May 2022 11:49 am

To: Richard Maloney < <u>rmaloney@doc.govt nz</u>

Subject: RE: indirect costs for programme management

Richard. Urgent. Zone 4 tekapo. Scenario 1 Island creation and replacement what are figures Sent from Workspace ONE Boxer

On 6/05/2022 10:30 am, Richard Maloney < rmaloney@doc.govt.nz > wrote:

Not unless you are really suck...

15% contingency (ie work on the ground costs)

15% indirects (programme mgmt, office support etc.)

We could make it be part of the 15% indirects, and given the size of the overall budget that might work. To run this amount of work is a several person team at \$100k pp = 700k - 1mill pa for staff costs alone.

At \$10mill directs = \$13mill total. That is \$1.5mill for indirects. Take off half of that for staff costs, doesn't leave much for office support, or DOC overheads (i.e., <7%, doubt CSG will be too happy with that).

It would be safer to say that the tables we have provided are direct work costs. Contingency will be set at an average of 15% (will be higher for some things – eg building costs, anything involving transport and fuel), and that <u>indirects are still being confirmed</u> but will be around 15% for programme indirects, and 15% for DOC national indirects.

Its normal to add these. Be good to get advise / check in at some stage with national accountant group in CSG to confirm this approach.

Cheers

Richard

From: Ken Hughey < khughey@doc.govt.nz>

Sent: Friday, 6 May 2022 9:42 am

To: Richard Maloney < rmaloney@doc.govt.nz >

Subject: indirect costs for programme management

Richard. Does the 30% do that? Sent from Workspace ONE Boxer

On 6/05/2022 9:34 am, Richard Maloney < rmaloney@doc.govt.nz > wrote:

I think we should be clear that we mean the indirect 15% we have included is for Programme <u>level indirect costs</u> = programme management, direct staff costs, accommodation, training, office supplies etc, and not for DOC's national overheads. We should expect that DOC nationally will want to add in their corporate overheads as standard practise.

Otherwise, we will need to build in those programme indirects as a direct cost into each line item or Zone – a messy way to split this up.

Currently we haven't provided for the programme management level / offices etc to make this project work within each of the zone line items.

Cheers

Richard

Dr Richard Maloney Principal Technical Advisor - Biodiversity Group Department of Conservation,

eleased under 265 Princes St, Dunedin 9016, New Zealand

From: Richard Maloney
To: Ken Hughey

Subject: RE: indirect costs for programme management

Date: Friday, 6 May 2022 11:58:05 am

No costs in scenario 1 because the braid plain has been managed – ie all the islands are done as part of the whole of river mgmt.

(in Waitaki we built some islands in scenario 1 because we thought it would take awhile to achieve clearance for the whole river – different in Tekapo because bulldozing is easier and river is smaller...).

Okay?

R

From: Ken Hughey <khughey@doc.govt.nz>

Sent: Friday, 6 May 2022 11:49 am

To: Richard Maloney <rmaloney@doc.govt.nz>

Subject: RE: indirect costs for programme management

Richard. Urgent. Zone 4 tekapo. Scenario 1 Island creation and replacement what are figures

Sent from Workspace ONE Boxer

On 6/05/2022 10:30 am, Richard Maloney < rmaloney@doc.govt.nz> wrote:

Not unless you are really stuck ...

15% contingency (ie work on the ground costs)

15% indirects (programme mgmt, office support etc.)

We could make it be part of the 15% indirects, and given the size of the overall budget that might work. To run this amount of work is a several person team at \$100k pp = 700k - 1mill pa for staff costs alone.

At \$10mill directs = \$13mill total. That is \$1.5mill for indirects. Take off half of that for staff costs, doesn't leave much for office support, or DOC overheads (i.e., <7%, doubt CSG will be too happy with that).

It would be safer to say that the tables we have provided are direct work costs. Contingency will be set at an average of 15% (will be higher for some things – eg building costs, anything involving transport and fuel), and that <u>indirects are still being confirmed</u> but will be around 15% for programme indirects, and 15% for DOC national indirects.

Its normal to add these. Be good to get advise / check in at some stage with national accountant group in CSG to confirm this approach.

Cheers Richard

From: Ken Hughey < khughey@doc.govt.nz>

Sent: Friday, 6 May 2022 9:42 am

To: Richard Maloney < rmaloney@doc.govt.nz >

Subject: indirect costs for programme management

Richard. Does the 30% do that? Sent from Workspace ONE Boxer

On 6/05/2022 9:34 am, Richard Maloney < rmaloney@doc.govt.nz> wrote:

Hi Ken and Jo

I think we should be clear that we mean the indirect 15% we have included is for <u>Programme</u> <u>level indirect costs</u> = programme management, direct staff costs, accommodation, training, office supplies etc, and not for DOC's national overheads. We should expect that DOC nationally will want to add in their corporate overheads as standard practise.

Otherwise, we will need to build in those programme indirects as a direct cost into each line item

or Zone – a messy way to split this up.

Currently we haven't provided for the programme management level / offices etc to make this Released under Official Information Act project work within each of the zone line items.

Cheers

From: Richard Maloney To: Ken Hughev

Subject: RE: indirect costs for programme management

Date: Friday, 6 May 2022 10:30:13 am

Not unless you are really stuck ...

15% contingency (ie work on the ground costs)

15% indirects (programme mgmt, office support etc.)

We could make it be part of the 15% indirects, and given the size of the overall budget that might work. To run this amount of work is a several person team at 100k pp = 700k – 1mill pa for staff costs alone.

At \$10mill directs = \$13mill total. That is \$1.5mill for indirects. Take off half of that for staff costs, doesn't leave much for office support, or DOC overheads (i.e., <7%, doubt CSG will be too happy with that).

It would be safer to say that the tables we have provided are direct work costs. Contingency will be set at an average of 15% (will be higher for some things – eg building costs, anything involving transport and fuel), and that indirects are still being confirmed but will be around 15% for programme indirects, and 15% for DOC national indirects.

Its normal to add these. Be good to get advise / check in at some stage with national accountant group in CSG to confirm this approach.

Cheers

Richard

From: Ken Hughey <khughey@doc.govt.nz>

Sent: Friday, 6 May 2022 9:42 am

To: Richard Maloney <rmaloney@doc.govt.n

Subject: indirect costs for programme management

Richard. Does the 30% do that? Sent from Workspace ONE Boxer

On 6/05/2022 9:34 am, Richard Maloney < rmaloney@doc.govt.nz > wrote:

Hi Ken and Jo

I think we should be clear that we mean the indirect 15% we have included is for <u>Programme</u> level indirect costs = programme management, direct staff costs, accommodation, training, office supplies etc, and not for DOC's national overheads. We should expect that DOC nationally will want to add in their corporate overheads as standard practise.

Otherwise, we will need to build in those programme indirects as a direct cost into each line item or Zone – a messy way to split this up.

Currently we haven't provided for the programme management level / offices etc to make this project work within each of the zone line items.

Chee s

Richard

Dr Richard Malonev Principal Technical Advisor - Biodiversity Group

265 Princes St, Dunedin 9016, New Zealand

ph +64 9 (2) (2

e-mail rmaloney@doc.govt.nz

Department of Conservation.

From: **Richard Maloney**

To: Ken Hughey; Jo Macpherson

Subject: indirect costs for programme management

Date: Friday, 6 May 2022 9:34:55 am

Hi Ken and Jo

I think we should be clear that we mean the indirect 15% we have included is for Programme level indirect costs = programme management, direct staff costs, accommodation, training, office supplies etc, and not for DOC's national overheads. We should expect that DOC nationally will want to add in their corporate overheads as standard practise.

Otherwise, we will need to build in those programme indirects as a direct cost into each line item or Zone – a messy way to split this up.

Currently we haven't provided for the programme management level / offices etc to make his project work within each of the zone line items.

Richard

Dr Richard Maloney Leleased under Official Principal Technical Advisor – Biodiversity Group Department of Conservation,

From: **Richard Maloney** Ken Hughey To:

Subject: Scenarios for levels of value management in all of Waitaki Catchment_SUMMARY.xlsx

Date: Thursday, 5 May 2022 8:26:06 pm

Scenarios for levels of value management in all of Waitaki Catchment SUMMARY.xlsx Attachments:

Importance: High

Hi Ken

Here's the excel spread sheet. Not in DOCCM yet, because I haven't figured that out on my machine yet ...

Red tabs – the costs and summary of work

Orange tabs – one for each zone, the targets for each scenario

Blue tabs – my workings for the calculations in the red tabs

Hope that all makes sense – about as good as I can get given not much time to work on this. I can see a few gaps, the fish reserve is partially covered but might need more ...

Regardless – the test of the money in the scenarios still feels okay to me – we will do substantive work if we land scenario 1, or perhaps a combo of some scenario 1 and some scenario 2.

Scenario 3 is less than satisfying and will not deliver. eleased under official

Cheers

Average annual direct costs Scenario 1

Zone	Zone short name	
ZONE 1	Lower Waitaki, Hakataramea	\$ 3,500,000
ZONE 2	Ahuriri catchment and lower Lakes	\$ 1,000,000
ZONE 3A	Hopkins/Dobson, Tasman, Lakes Pukaki and Ohau	\$ 550,000
ZONE 3B	Pukaki, Upper and Lower Ohau Rivers and mid-Lakes	\$ 1,900,000
ZONE 4	Tekapo catchment, Lake Tekapo, Godley, Cass, MacAulay	\$ 2,950,000
	TOTAL average annual direct cost	\$ 9,950,000

Average annual direct costs Scenario 2

		_	
Zone	Zone short name		
ZONE 1	Lower Waitaki, Hakataramea	\$	1,650,000
ZONE 2	Ahuriri catchment and lower Lakes	\$	1,000,000
ZONE 3A	Hopkins/Dobson, Tasman, Lakes Pukaki and Ohau	\$	550,000
ZONE 3B	Pukaki, Upper and Lower Ohau Rivers and mid-Lakes	\$	1,850,000
ZONE 4	Tekapo catchment, Lake Tekapo, Godley, Cass, MacAulay	\$	1,850,000
	TOTAL average annual direct cost	\$	6,850,000

Average annual direct costs Scenario 3

7 short some
ne Zone short name
NE 1 Lower Waitaki, Hakataramea
NE 2 Ahuriri catchment and lower Lakes
NE 3A Hopkins/Dobson, Tasman, Lakes Pukaki and Ohau
NE 3B Pukaki, Upper and Lower Ohau Rivers and mid-Lakes NE 4 Tekapo catchment, Lake Tekapo, Godley, Cass, MacAulay
TOTAL average annual direct cost

Scenario 1 average annual costs (Direct+15%OH+15%contingency)

Zone	Zone short name	Total
ZONE 1	Lower Waitaki, Hakataramea	\$ 4,550,000
ZONE 2	Ahuriri catchment and lower Lakes	\$ 1,300,000
ZONE 3A	Hopkins/Dobson, Tasman, Lakes Pukaki and Ohau	\$ 700,000
ZONE 3B	Pukaki, Upper and Lower Ohau Rivers and mid-Lakes	\$ 2,450,000
ZONE 4	Tekapo catchment, Lake Tekapo, Godley, Cass, MacAulay	\$ 3,850,000
	TOTAL average annual direct + indirect cost	\$ 12,950,000

Scenario 2 average annual costs (Direct+15%OH+15%contingency)

Zone	Zone short name	
ZONE 1	Lower Waitaki, Hakataramea	\$ 2,100,000
ZONE 2	Ahuriri catchment and lower Lakes	\$ 1,300,000
ZONE 3A	Hopkins/Dobson, Tasman, Lakes Pukaki and Ohau	\$ 750,00
ZONE 3B	Pukaki, Upper and Lower Ohau Rivers and mid-Lakes	\$ 2,400,000
ZONE 4	Tekapo catchment, Lake Tekapo, Godley, Cass, MacAulay	\$ 2,400,00
	TOTAL average annual direct + indirect cost	\$ 8,900,000

Scenario 3 average annual costs (Direct+15%OH+15%contingency)

Scenario 3 a	verage annual costs (Direct 15/001115/00011tingency)		
Zone	Zone short name		
ZONE 1	Lower Waitaki, Hakataramea	\$	950,000
ZONE 2	Ahuriri catchment and lower Lakes	\$	850,000
ZONE 3A	Hopkins/Dobson, Tasman, Lakes Pukaki and Ohau	\$	650,000
ZONE 3B	Pukaki, Upper and Lower Ohau Rivers and mid-Lakes	\$	1,600,000
ZONE 4	Tekapo catchment, Lake Tekapo, Godley, Ca s, M cAula	\$	1,150,000
	TOTAL average annual direct + indirect cost	Ś	5.050.000

Restoration of braid plains and side streams, wetland enhance catchment including fish and tuna habitat, island creation, were and targeted predator control, knowledge gaps filled. Focussed restoration in key exemplar sites on river with associand predator management, some broadscale river weed mana targeted lake edge weed control, site specific threatened specemanagement, knowledge gaps filled, wetland enhancement in including fish and tuna habitat, tuna restoration via ansignation of the provided pr	Restoration of braid plains and side streams, wetland enhance catchment including fish and tuna habitat, island creation, were and targeted predator control, knowledge gaps filled. Focussed restoration in key exemplar sites on river with associ and predator management, some broadscale river weed mana targeted lake edge weed control, site specific threatened specimanagement, knowledge gaps filled, wetland enhancement in including fish and tuna habitat, tuna restoration via ansi cat Landscape scale predator management in lower river eaches, control on rivers and adjacent to native values on lakes, site specific threatened specimanagement, knowledge gaps filled, wetland enhancement in catchment including fish and tuna habitat, turestoration via translocation Exemplar sites with predator and weed management in lower reaches focused on threatened species hotspots, low level were adjacent to native value on lakes, side stream restoration, and terrestrial braid plains weeds managed, knowledge gaps filled, verhancement in catchment including fish and tuna habitat, turestoration is translocation Tekapo catchment, Lake Tekapo, Godley, Cass, MacAulay Tekapo catchment, Lake Tekapo, Godley, Cass, MacAulay	ZONE	ZONE NAME	Key focus of work
and predator management, some broadscale river weed mana targeted lake edge weed control, site specific threatened specimanagement, knowledge gaps filled, wetland enhancement in including fish and tuna habitat, tuna restoration via ansi catiful Landscape scale predator management in lower river eaches, control on rivers and adjacent to native values in lakes, site specific threatened species management, knowledge gaps filled, wetlangement in catchment including fish and tuna habitat, tuna restoration via translocation Exemplar sites with predator and weed management in lower reaches focused on threatened species hotspots, low level were adjacent to native values on lakes, side stream restoration, and terrestrial braid plain weeds managed, knowledge gaps filled, venhancement in catchment including fish and tuna habitat, ture restoration is translocation Exemplar sites with predator and weed management in lower reaches focused on threatened species hotspots, low level were adjacent to native values on lakes, side stream restoration, and terrestrial braid plain weeds managed, knowledge gaps filled, venhancement in catchment including fish and tuna habitat, ture restoration is translocation Exemplar sites with predator and weed management in lower reaches focused on threatened species hotspots, low level were adjacent to native values on lake, side stream restoration, and terrestrial braid plain weeds managed, knowledge gaps filled, venhancement in catchment including fish and tuna habitat, island creation, were adjacent to native values on Lake, and of wetlands in catchment. Tuna restoration via translocation, Island restoration, spot weed control on lake ed.	and predator management, some broadscale river weed mana targeted lake edge weed control, site specific threatened specimanagement, knowledge gaps filled, wetland enhancement in including fish and tuna habitat, tuna restoration via ansi cation including fish and tuna habitat, tuna restoration via ansi cation including fish and tuna habitat, tuna restoration via ansi cation including fish and tuna habitat, tuna restoration via ansi cation including fish and tuna habitat, tuna restoration via ansi cation including fish and tuna habitat, tuna restoration including fish and tuna habitat, tuna restoration including fish and tuna habitat, tuna restoration including fish and tuna habitat, tuna restoration, and weed management in lower reaches focused on threatened species hotspots, low level were adjacent to native values on lakes, side stream restoration, and terrestrial braid plain weeds managed, knowledge gaps filled, venhancement in catchment including fish and tuna habitat, tuna restoration including fish and tuna habitat, tuna restoration, were and targeted predator control, knowledge gaps filled. Restoration of braid plains and side streams, wetland enhance catchment including fish and tuna habitat, island creation, were and targeted predator control, knowledge gaps filled. Restoration on Lake, and of wetlands in catchment. Tuna restoration via translocation, Island restoration, spot weed control on lake ed			Restoration of braid plains and side streams, wetland enhance catchment including fish and tuna habitat, island creation, wee
ZONE 3A Hopkins/Dobson, Tasman, Lakes Pukaki and Ohau Control on rivers and adjacent to native values on lakes, site spothreatened species management, know edge gaps filled, wetla enhancement in catchment including fish and tuna habitat, ture restoration via translocation Exemplar sites with predator and weed management in lower reaches focused on threatened species hotspots, low level weed adjacent to native values on lakes, side stream restoration, and terrestrial braid plain weeds managed, knowledge gaps filled, wenhancement in catchment including fish and tuna habitat, ture restoration is translocation ZONE 4 Tekapo catchment, Lake Tekapo, Godley, Cass, MacAulay Tekapo catchment in catchment including fish and tuna habitat, ture restoration, and terrestoration	Control on rivers and adjacent to native values on lakes, site spot threatened species management, know edge gaps filled, wetlaten enhancement in catchment including fish and tuna habitat, tungers and mid-Lakes. Exemplar sites with predator and weed management in lower reaches focused on threatened species hotspots, low level were adjacent to native values on lakes, side stream restoration, and terrestrial braid plain weeds managed, knowledge gaps filled, we enhancement in catchment including fish and tuna habitat, tungestoration in translocation. Exemplar sites with predator and weed management in lower reaches focused on threatened species hotspots, low level were adjacent to native values on lakes, side stream restoration, and terrestrial braid plain weeds managed, knowledge gaps filled, we enhancement in catchment including fish and tuna habitat, tungestoration in translocation. Restoration of braid plains and side streams, wetland enhance catchment including fish and tuna habitat, island creation, were and targeted predator control, knowledge gaps filled. Restoration Lake, and of wetlands in catchment. Tuna restoration via translocation, Island restoration, spot weed control on lake editions.	ZONE 2	Ahuriri catchment and lower Lakes	and predator management, some broadscale river weed mana targeted lake edge weed control, site specific threatened speci management, knowledge gaps filled, wetland enhancement in
Pukaki, Upper and Lower Ohau Rivers and mid-Lakes terrestrial braid plain weeds managed, knowledge gaps filled, wenhancement in catchment including fish and tuna habitat, tur restoration ia translocation Restoration of braid plains and side streams, wetland enhance catchment including fish and tuna habitat, island creation, we and targeted predator control, knowledge gaps filled. Restoration Lake, and of wetlands in catchment. Tuna restoration via translocation, Island restoration, spot weed control on lake ed.	Pukaki, Upper and Lower Ohau Rivers and mid-Lakes terrestrial braid plain weeds managed, knowledge gaps filled, wenhancement in catchment including fish and tuna habitat, tur restoration ia translocation Restoration of braid plains and side streams, wetland enhance catchment including fish and tuna habitat, island creation, we and targeted predator control, knowledge gaps filled. Restoration Lake, and of wetlands in catchment. Tuna restoration via translocation, Island restoration, spot weed control on lake ed.	ZONE 3A	Hopkins/Dobson, Tasman, Lakes Pukaki and Ohau	control on rivers and adjacent to native values in lakes, site sp threatened species management, know edge gaps filled, wetla enhancement in catchment including fish and tuna habitat, tur
ZONE 4 Tekapo catchment, Lake Tekapo, Godley, Cass, MacAulay Tekapo catchment, Lake Tekapo, Godley, Cass, MacAulay Tekapo catchment, Lake Tekapo, Godley, Cass, MacAulay on Lake, and of wetlands in catchment. Tuna restoration via translocation, Island restoration, spot weed control on lake ed	ZONE 4 Tekapo catchment, Lake Tekapo, Godley, Cass, MacAulay Tekapo catchment, Lake Tekapo, Godley, Cass, MacAulay Tekapo catchment, Lake Tekapo, Godley, Cass, MacAulay on Lake, and of wetlands in catchment. Tuna restoration via translocation, Island restoration, spot weed control on lake ed	ZONE 3B	Pukaki, Upper and Lower Ohau Rivers and mid-Lakes	reaches focused on threatened species hotspots, low level wed adjacent to native values on lakes, side stream restoration, and terrestrial braid plain weeds managed, knowledge gaps filled, enhancement in catchment including fish and tuna habitat, tur
inger	ased under			catchment including fish and tuna habitat, island creation, were and targeted predator control, knowledge gaps filled. Restoration Lake, and of wetlands in catchment. Tuna restoration via translocation, Island restoration, spot weed control on lake ed
			ingel	· ·

ZONE 1 Zone short name			L		<u> </u>	1	Lower Waitaki H	akataramea		<u> </u>			
Activity/Area		Lower Waitaki River	Lower Waitaki River	Lower Waitaki River	Lower Waitaki River	Lower Waitaki River			Lower Waitaki River	Lower Waitaki catchment and Hakataramea	Lower Waitaki catchment and Hakataramea	Lower Waitaki catchment and Hakataramea	Lower Waitaki catchment and Hakataramea
	Island creation (ha)	Island replacement (no.)	Braid plain clearance (km)	Weed maintenance - cleared areas (ha)	Small mammal ongoing predator mgmt at cleared areas	Small mammal setup predator mgmt at cleared areas		Wetlands cleared (ha)	Wetlands restored planting fencing (ha)	Offsite native fish protection using weirs and pest fish removal (no.)	Knowledge gaps filled	Application of key findings from knowledge gaps	Tuna supplementation
Scenario 1	60 islands	6 islands	60 km cleared	1500 ha treated	1500 ha trapped	1500 ha of traps setup	10 colonies	240 ha	240 ha	31 weirs built	invertebrate, lizard and fish knowledge gaps filled	Management applie to all knowledge gap	ed Translocation into ps all key habitats
Scenario 2	30 islands	3 islands	25 km cleared	600 ha treated	600 ha trapped	600 ha of traps setup	8 colonies	190 ha	190 ha	25 weirs built	invertebrate, lizard and fish knowledge gaps filled	Management applie to all knowledge gap	
Scenario 3	15 islands	1.5 islands	8 km cleared	200 ha treated	200 ha trapped	200 ha of traps setup	5 colonies	120 ha	120 ha	15 weirs built	invertebrate, lizard and fish knowledge gaps filled	Management applie to a few knowledge gaps	
	25												

ZONE 2 Zone sho t name				L		ı		L	Abu casa	chment and lowe	Lakas	<u> </u>	<u> </u>	<u> </u>		1 1		
Act v ty/A ea	Lowe Ahu	Lowe Ahu	Lowe Ahu	Lowe Ahu	Lowe Ahu	Lowe Ahu	Ahu R ve	Ahu Catchment	Ahu Catchment	Ahu Catchment	Ahu Catchment	Ahu Catchment	Ahu and Lakes	Ahu Catchment	Uppe Uppe Ahu Ahu		es Benmo e, emo e, Wa tak	
Key management act ons	Island c eat on (ha)	Island eplacement (no.)	B ad plan clea ance (km) PCL	ciea ed a eas	Sma I mammal ongo ng p edato mgmt at clea ed	Small mammal setup p edato mgmt at	Black backed gull p edato cont ol (no)	Wetlands clea ed (ha)	Wetlands esto ed plant ng,	Offs te nat ve f sh p otect on us ng we s and pest f sh	Knowledge gaps filed	Appl cat on of key f nd ngs f om knowledge gaps	Tuna supplementat on	S de st eam catchment management	mammal mammal ongo ng setup p edato p edato mgmt at mgmt at	ma ntenance th e	ected eatened spec es nagement	
Scenario 1	15 islands	3 islands	3 km cleared	(ha) 60 ha treated	a eas 3000 ha trapped	clea ed a eas 000 ha of traps setup	3 colonies	100 ha	fenc ng (ha)	emoval (no.)	invertebrate lizard and fish knowledge gaps	Management applied to all knowledge gaps	Translocation into all key habitats	1 side stream with weed	clea ed clea ed 3000 ha trapped of traps	10 km of weed 5 sp	eces) pecies sites naged	
Scenario 2	12 islands	2 islands	3 km cleared	60 ha treated	3000 ha trapped	000 ha of traps setup	3 colonies	80 ha	80 ha	8 weirs built	filled invertebrate lizard and fish knowledge gaps filled	Management applied	Translocation into	management 1 side stream with weed management	3000 ha of trans	8 km of weed 5 sp	pecies sites	
Scenario 3	7 islands	1.5 islands	3 km cleared	60 ha treated	800 ha trapped	800 ha of traps setup	3 colonies	50 ha	50 ha	5 weirs built	invertebrate lizard and fish knowledge gaps	Management applied to a few knowledge	Translocation into some key habitats	O sides treams with weed	800 ha trapped	of 5 km of weed 5 sp management mar	pecies sites	×
3			2			5												

Zone short name									
				Hopkins	/Dobson, Tasman, Lakes Pukaki a	and Ohau			
Activity/Area	Hopkins/Dobso	Hopkins/Dobso n, Tasman catchments	Hopkins/Dobso n	Hopkins/Dobso n, Tasman	Tasman	Lake Pukaki and Lake Ohau	Lake Pukaki and Lake Ohau	Lake Pukaki Island	n, Ta Lake and
Key management actions	Small mammal predator mgm (km of lines)	Wetlands restored planting, fencing (ha)	Weed maintenance (ha)	Black backed gull predator control (no.)	Maintenance surveillance and residual pest control as per transformational knockdown by	Weed management on lake edge	Site specific threatened species management	Remove weeds and pests, and restore ecological values	5
Scenario 1	20 km of trap lines	50 ha wetlands	100 ha treated	2 colonies	9000 ha under survellience and response	5 km of weed management	5 species sites managed	All pests and weeds managed	Trar into hab
Scenario 2	20 km of trap lines	30 ha wetlands	100 ha treated	2 colonies	9000 ha under survellience and response	3 km of weed management	5 species sites managed	Some pests and weeds managed	Tra o key
Scenario 3	(25 ha wetlands	100 ha treated	2 colonies	and response	1 km of weed management	5 species sites managed	Few y pes and we ds ma ged	Trai into key
3/6.0		JY.	,de	O	KICIO!				

ZONE B			<u> </u>	<u> </u>		<u> </u>	L	Dukak Hana	and laws. Obs	u R ve s and m d	Lakee	Ļ	<u> </u>	<u> </u>	<u> </u>	<u> </u>	<u> </u>		
Act v ty/A ea	Lowe Ohau R ve	Lowe Ohau R ve	Lowe Ohau, Pukak R ve s	Lowe Ohau, Pukak R ve s	Lowe Ohau, Pukak R ve s	Lowe Ohau, Pukak R ve s	Lowe Ohau, Pukak R ve s	Uppe and Lowe Ohau and Pukak	Uppe and Lowe Ohau and Pukak	Uppe and Lowe Ohau and Pukak	Uppe and Lowe Ohau and Pukak Catchments	Uppe and Lowe Ohai		Uppe and Lowe Ohau and Pukak Catchments	Lake Benmo e, Lake Ruatan wh	Lake Benmo e ma g ns	Lake Benmo e Islands		
Key management	Island c eat on	on Island eplacement	B a d pla n	Weed ma ntenance -		Small mammal	Black backed gull p edato	Catchments Wetlands	Wetlands esto ed	Offs te nat ve f sh p otect on us ng we s	Knowledge gaps f lled	Appl cat on of key f nd ngs f om	Tuna	S de st eam catchment	Ta geted weed ma ntenan	Selected th eatened spec es	and pests, and		
act ons	(ha)	(no.)	clea ance (km)	(ha)	Small mammal ongo ng p edato mgmt at clea ed a eas	setup p edato mgmt at clea ed a eas	cont ol (no.)	clea ed (ha)	plant ng, fenc ng (ha)	and pest f sh emoval (no. s tes)		knowledge gaps	supplementat on	management (weeds)	ce (km of sho el ne)	manageme nt (spec es)	esto e ecolog cal values All pests and		
Scenario 1	2 islands	0.5 islands	0 km cleared	cleared	2000 ha trapped	2000 ha with traps setup	1 colony	40 ha	40 ha	4 weirs built	invertebrate lizard and fish knowledge gaps filled invertebrate lizard and	to a I knowledge gap	Translocation into	with weed management	weed managem ent 1 km of	2 species sites managed 2 species	weeds managed	4	×
Scenario 2	2 islands	0.5 islands	8 km cleared	800 ha cleared	2000 ha trapped	2000 ha with traps setup	1 colony	0 ha	30 ha	2 weirs built	fish knowledge gaps filled	to a I knowledge gap	all some key habitats	with weed management	weed managem ent 1 km of	2 species managed 2 species	and weeds managed		
Scenario 3	2 islands	0.5 islands	5 km cleared	500 ha cleared	1000 ha trapped	1000 ha with traps setup	1 colony	25 ha	25 ha	1 weir built	fish knowledge gaps filled	to a few knowledge gaps	Translocation into some key habitats	with weed management	weed managem ent	sites managed	and weeds managed		
S/6			25																

ZONE 4 Zous sho it name Act vig/A so Key management act one. Scena o 1	Telapo R ve Telapo R ve and adjacent and adjacent stand fallone taken to applicement of allowing the stand to allow the stand	B a d plan mantenance - p c dea ance dea a eac a eac dea ed dea e	Lapp it w and adjacent seed for any fridage it we find grip in the did not seed for any find grip in the did not seed for any find grip in the did not seed for any find any f	we feature it is a control of the co	por catchment, Lake Trikago, Gorling, Casis, Markulain, Lake Trikago man g mi Lake Trikago Islandi. Take got C this watened. Take got C this watened. Take got C this watened. Signet on management All perists and weed managed.	Wetlands n Tekapo Cass, Godley, Tekapo Tekapo Catchment McAuluy R vs C Canal Canal P Cotect and enhance decolog cal values su ve llunce and Canal Cana	ope Craul Generality pass Talago sathment Sectioners and of General connect vity. By a Card of Mark 2 of Asia vity of Passage Card Vity Pa	Triuppe (Integer cachment State & San State Stat
Scena o 2	25 slands 3 slands 10 slands 1.5 slands	dea ed dea ed	0 ha t apped 600 ha with t apsietup 2 colon to tape of the tapsietup 1 colony to ha t apped 190 ha with t apsietup 1 colony tapes of tapes	out clea ed esto ed esto ed	5 spec es s tes Some pests and weeds managed 5 spec es s tes Few key pests and weeds managed	200 ha wetlands under weth 22 km 1 200 ha wetlands under exponse cont of cont	wetland of and off the connect viry honoviedge pars filed some to viry the connect viry honoviedge pars filed some to all the connect viry had been connected to all the connected viry wetlands connected viry viry and the connected viry viry viry viry viry viry viry viry	at come with 2 we s weed of the life of th
	30						and stated states are a state of the state o	

age annual cost S1		Sum of S1 annual	(Direct 15% OH 15%contingency)			
Zone short name	Total	Zone	Zone short name	Total		
Lower Waitaki Hakataramea	3 531 757	ZONE 1	Lower Waitaki Hakataramea	4 591 284	3531757.14 4591284.29	350
Ahuriri catchment and lower Lakes	1 028 457	ZONE 2	Ahuriri catchment and lower Lakes	1 336 994	1028457.14 1336994.29	100
Hopkins/Dobson Tasman Lakes Pukaki and Ohau	574 357	ZONE 3A	Hopkins/Dobson Tasman Lakes Pukaki and Ohau	746 664	574357.143 746664.286	55
Pukaki Upper and Lower Ohau Rivers and mid-Lakes	1 900 379	ZONE 3B	Pukaki Upper and Lower Ohau Rivers and mid-Lakes	2 470 492	1900378.57 2470492.14	190
Tekapo catchment Lake Tekapo Godley Cass MacAulay	2 962 383	ZONE 4	Tekapo catchment Lake Tekapo Godley Cass MacAulay	3 851 098	2962382.86 3851097.71	295
	9,997,333	Grand Total		12,996,533	9997332.86 12996532.7	995
	Zone short name	Zone short name Total Lower Waltaki Hakataramea 3 531 757 Ahuriri catchment and lower Lakes 1 028 457 Hopkins/Dobson Tasman Lakes Pukaki and Ohau 574 357 Pukaki Upper and Lower Ohau Rivers and mild-Lakes 1 900 379 Tekapo catchment Lake Tekapo Godley Cass MacAulay 2 962 383	Zone short name Total Zone Lower Waltaki Hakataramea 3 531 757 ZONE 1 Ahuriri catchment and lower Lakes 1 028 457 ZONE 2 Hopkins/Dobson Tasman Lakes Pukaki and Ohau 57 4 357 ZONE 3A Pukaki Upper and Lower Ohau Rivers and mid-Lakes 1 900 379 ZONE 3B Tekapo catchment Lake Tekapo Godley Cass MacAulay 2 962 383 ZONE 4	Zone short name Total Zone Zone short name Lower Waltaki Hakataramea 3 531 757 ZONE 1 Lower Waltaki Hakataramea Abruiri catchment and lower Lakes 1 028 457 ZONE 2 Abruiri catchment and lower Lakes Hopkins/Dobson Tasman Lakes Pukaki and Ohau 574 357 ZONE 3A Hopkins/Dobson Tasman Lakes Pukaki and Ohau Pukaki Upper and Lower Ohau Rivers and mid-Lakes 1 900 379 ZONE 3B Pukaki Upper and Lower Ohau Rivers and mid-Lakes Tekapo catchment Lake Tekapo Godley Cass MacAulay 2 962 383 ZONE 4 Tekapo catchment Lake Tekapo Godley Cass MacAulay	Zone short name Total Zone short name Zone short name Total Lower Waltaki Hakataramea 3 531 757 ZONE 1 Lower Waltaki Hakataramea 4 591 284 Ahuriri catchment and lower Lakes 1 028 457 ZONE 2 Ahuriri catchment and lower Lakes 1 336 994 Hopkins/Dobson Tasman Lakes Pukaki and Ohau 574 357 ZONE 3A Hopkins/Dobson Tasman Lakes Pukaki and Ohau 746 664 Pukaki Upper and Lower Ohau Rivers and mid-Lakes 1 900 379 ZONE 3B Pukaki Upper and Lower Ohau Rivers and mid-Lakes 2 470 492 Tekapo catchment Lake Tekapo Godley Class MacAulay 2 962 383 ZONE 4 Tekapo catchment Lake Tekapo Godley Class MacAulay 3 851 098	Zone short name Total Zone short name Zone short name Total Lower Waltaki Hakataramea 3 531 757 ZONE 1 Lower Waltaki Hakataramea 4 591 284 351757.14 4 591284.29 Hopkins/Dobson Tasman Lakes Pukaki and Ohau 574 357 ZONE 3 Hopkins/Dobson Tasman Lakes Pukaki and Ohau 746 664 574357.143 746664 286 Pukaki Upper and Lower Ohau Rivers and mid-Lakes 1900 379 2ONE 3 Pukaki Upper and Lower Ohau Rivers and mid-Lakes 2 470 492 14 74921.14 Tekapo catchment Lake Tekapo Godley Cass MacAulay 2 962 383 20NE 4 Tekapo catchment Lake Tekapo Godley Cass MacAulay 3 851 089 2962 382.86 881907.71

Sum of Avera	ge annual cost S2		Sum of S2 annual	(Direct 15% OH 15%contingency)					
Zone	Zone short name	Total	Zone	Zone short name	Total				
ZONE 1	Lower Waitaki Hakataramea	1 612 040	ZONE 1	Lower Waitaki Hakataramea	2 095 652	1612040	2095652	1650000	2100000
ZONE 2	Ahuriri catchment and lower Lakes	979 771	ZONE 2	Ahuriri catchment and lower Lakes	1 273 703	979771.429	1273702.86	1000000	1300000
ZONE 3A	Hopkins/Dobson Tasman Lakes Pukaki and Ohau	546 214	ZONE 3A	Hopkins/Dobson Tasman Lakes Pukaki and Ohau	710 079	546214.286	710078.571	550000	750000
ZONE 3B	Pukaki Upper and Lower Ohau Rivers and mid-Lakes	1 841 493	ZONE 3B	Pukaki Upper and Lower Ohau Rivers and mid-Lakes	2 393 941	1841492.86	2393940.71	1850000	2400
ZONE 4	Tekapo catchment Lake Tekapo Godley Cass MacAulay	1 839 469	ZONE 4	Tekapo catchment Lake Tekapo Godley Cass MacAulay	2 391 309	1839468.57	2391309.14	1850000	24000
Grand Total		6,818,987	Grand Total		8,864,683	6818987.14	8864683.29	6850000	8900000

ZONE 3B	Pukaki Upper and Lower Ohau Rivers and mid-Lakes	1 841 493	ZONE 3B	Pukaki Upper and Lower Ohau Rivers and mid-Lakes	2 393 941	1841492.86 239	3940.71 1850000	
ZONE 4	Tekapo catchment Lake Tekapo Godley Cass MacAulay	1 839 469	ZONE 4	Tekapo catchment Lake Tekapo Godley Cass MacAulay		1839468.57 239		
Grand Total		6,818,987	Grand Total		8,864,683	6818987.14 886	4683.29 6850000	8900000
								\
	Scenario 3							
	rage annual cost \$3	Total		Direct 15% OH 15%contingency)	Total		4	
Zone ZONE 1	Zone short name Lower Waitaki Hakataramea	Total 694 851	Zone ZONE 1	Zone short name Lower Waitaki Hakataramea	Total 903 307	694851.429 903	306.857 0 00	950000
ZONE 2	Ahuriri catchment and lower Lakes	620 614	ZONE 2	Ahuriri catchment and lower Lakes	806 799	620614.286 806	798 571 6500 0	850000
ZONE 3A	Hopkins/Dobson Tasman Lakes Pukaki and Ohau	481 571	ZONE 3A	Hopkins/Dobson Tasman Lakes Pukaki and Ohau	626 043	481571.429 626	042.857 500000	650000
	Pukaki Upper and Lower Ohau Rivers and mid-Lakes	1 200 564	ZONE 3B	Pukaki Upper and Lower Ohau Rivers and mid-Lakes		1200564.29 156		
ZONE 4 Grand Total	Tekapo catchment Lake Tekapo Godley Cass MacAulay	872 869 3,870,470	ZONE 4 Grand Total	Tekapo catchment Lake Tekapo Godley Cass MacAulay		872868.857 113 3870470.29 503		
Grand Total		3,870,470	Grand Total		3,031,011	3870470.23 303	3500000	3030000
						•		
					<i>,</i> \			
				· · · · · · · · · · · · · · · · · · ·				
				* (\(\Lambda\)				
				/X \				
				XX				
		_						
		ZK						
		, i						
	-							
	•							
	30.50							

Part	Zone one of ame 20NE 1 Next to		. S i y A ea ove: Wol ski Sive	Key management actions scandic earion (ha)	Scena io Scena o 2	Scena io 3 blan	Act v Secand 25 year come to 16	Scena io 1 Scena o 2 High eve s Mode ate \$1,000 \$1,000	Scena io 3 Do m n mo Units	scena o 1 co scena o 2 cr sce 5180 000 590 000	ena olico to equency Oci							3+15% CN+1Diccont namercy 35 was co t car 35 was cost sc 35 yes cost scena to 3 5348 806 600 5238 664 850 5125 466 460 35 was o als
Part	ZONE 1 Hak ta		owe Wal aki Rive	scand epacement no)	6 3	3 15												
Part					60 25	5 8		5231000 5231000	5231000 km	S13 860 000 S5 775 000	\$1.848.000 once	1 5	3 860 000 SS 775 0	00 51848.000 53	96 000 \$165 000 \$52 80	0 \$514.000 \$21	4 500 SER 640	
Part				(10)		+		\$1700 \$1700	\$1,700 ha	\$2 550 000 \$1 020 000	\$340,000 annual	35 \$	9 250 000 \$35 700 0	00 \$11,900,000 \$2.5	50 000 \$1 000 000 \$340 00	0 \$3.315.000 \$1.32	6 000 S442 000	
Mathematical Content of the conten					-		3 695											
Part				at clea ed a eas	1500 600	o 200	mgnt at c ea ed a as B ack backed guil p edata					-						
				(NO) We lands c ea ed (ha)	240 190	120												
Mathematical Content of the conten			ove Wai ski Kive	We lands es o ed pla ting encing (to)	240 190	_												
Part	ZONE 1 Hak ta	Wai alii Saanua H	owe: Whi aki cat himent and raisa a amea	O site native iship otec ion using well sand pest ish lemoval (no.)	31 25	5 15	O cienale shipa ector using well candipect shi emmo into a test											
Mathematical Property of the content of the conte					1 1	1 1	tnow edge gaps I ed	\$580,000 \$580,000	5580 000 unt	SS80 000 SS80 000	\$580,000 Swea s	s	2 900 000 52 900 0	00 52900000 5	82.857 582.857 582.85	7 5207714 520	7714 5107714	
				amenda Selv	\$1 \$1	51	om know edge gaps	\$300,000 \$240,000	5150 000 unt	\$300,000 \$340,000	\$150,000 20 yea s	10	3 000 000 \$2 400 0	00 \$1500.000 \$	85 714 \$68 571 \$42 85	7 \$111.429 \$8	9 143 \$55 714	
					1 1	1 1		\$200,000 \$150,000	\$150,000 unit	\$200 000 \$150 000	\$150,000 eve y 2 years		2 400 000 \$1 800 0					
Mathematical Control	-	_			15 13	2 7												
Part	Morris	_				2 2												
Part	ZONE 2 Alchin	i ment and	ove Abuli	Weed maintenan e - c ea ed a eas (ta)	60 60	ω ω	Weed main enance - clea ed a esc (ha)										3 600 6133 600	
March Marc	20412		ove Abuli		3000 3000	10 800	p edata ingritatic ea ed a eac	\$71 \$71	1 \$71 km	\$213 000 \$213 000	\$56,800 annual	35	7455 000 \$7455 0	00 \$1988000 \$2	13 000 \$213 000 \$56 80	o \$276.900 \$27	6 900 \$73.840	
Mathematical Control of the contro	20AL 2			Sm Il manusol set p.p edato mgmt atcles ed a ess	3000 3000	10 800		548 568	SSR ha	\$204 000 \$204 000	\$54.400 Eve y 15 years	3						,
Mathematical Control of the contro	- Card	sker .		(10)	a 2	2 2		\$100,000 \$100,000	\$100 000 unit	\$300,000 \$300,000	\$300,000 Jyeas	3	\$800,000 \$800.0	00 S900'000 S	25714 \$25714 \$2571	4 \$33.429 \$3	3 429 \$33 429	
	200	sker			100 80	50		\$2,000 \$2,000		\$300 000 \$240 000	\$150 000 2 years	2	\$600 000 \$480 0	00 S900 000 S	17 143 \$13 714 \$8 57		7.829 \$11.143	
	Moute	ster		(ha)	100 80	s c	encing (ha) O sile naile ship o ection using well sandport in										2 286 \$12 929	
	Abo i i	ries .			1 1	1 1	ANNO IN CASE										9 529 55 943	+, () *
	Owe	akes			1 1	1 1											9 143 \$55 714	
	20162		thuiliand alies		1 1	1 1	Tura supplemen at on										6 857 566 857	
	Abutt	_		(week)	1 1	1 0					\$0 annual						3900 SO	
		_		regott at cl. a ed a eas			3 480	\$71 \$71	\$71 km	\$213 000 \$213 000	\$56,800 annual	35	7 455 000 57 455 0				6 900 \$73 840	
	Morris			at clea ed a eas Ya pe ed weed ma ntenan e i m.o.	3000 3000	000	regent at ciea ed a las			\$204 000 \$204 000	\$54.400 Eve y 15 years	1						
		_		cho e i a) Sel cted th extended spec es.	10 8	8 5											5 200 53 25	
Mathematical Control of the contro				manag ment(pecie)	30	5 5	Sina I mammal o eduto mem										5 000 255 00	▼
Marie Mari				(nes)	50 ×	0 25	at clea ed a eas											•
Mathematical Control of the contro	ukaki Mari in	is and	Jan State Company	Weed ma roman e ha)	100 100	100	Weed main enance - clea ed a esc ha)											
Mathematical Control of the contro	- Anki	d and	ropk on Dolb on Tauman	(no)	2 3	2 2	it ack backed gull p edato											
Part		i and		Maintenan e su vei la ce and es dual pest cont al as pe t ann o ma innal à noistean h	9000 9000	9000	Main erance or well ance and ecidus pect cost of as pe											
Part				Weed management on take edge	S 3	3 1	Weed management on ake edge	\$500 \$500	\$500 km	\$2 500 \$1 500	\$500 annual	35					1950 \$650	
					5 5	s s		\$30,000 \$30,000	\$30,000 unt	\$150 000 \$150 000	\$150,000 annual	35			_	0 \$295,000 \$29	5 000 \$195 000	
Part					1 1	1 1		\$500 000 \$400 000	\$250,000 unit	\$500 000 \$400 000	\$250,000 2 years					*		
Part	-2-22	i sad	NAME AND CRIME		2 2	2 2									· ·			
Part		i Uppe owe Ohau	owe Otsuitive	trand epacement no)	05 05	s os												
Part				B a d p air c ea ance (km)	10 8	e s												
Mathematical Content of the conten			ove Otsu Puls i Rive s	(fu)	800 800	500		\$1700 \$1700	\$1700 ha	\$1 360 000 \$1 360 000	\$850,000 annual	35 S	7600 \$47600					
Manual Control Manu				registration alled alleas			3 480	\$71 \$71	\$71 km	\$142 000 \$142 000			970 000 70 0	85 000 SI	42 000 \$142 000 \$71 00	0 \$184 600 \$18	4 600 \$92 300	
Marie Mari				at clea ed a eas	2000 2000	10 1000				\$136 000 \$136 000	\$68,000 Eve y 15 years	▼						
Marie Mari				(10)	40 30	0 25							\$20 600					
Marie	Make and or	i Uppe owe Ohau	Type and owe Oh wand Pulaki is chimens	We lands es o ed pla ting encing	40 30	10 25	Wet ands lectoled planting excinal (hal)											
Marie Mari				O it to mat we iship otec ion using well cand pect ish emoval (no	4 2	2 1	O sienale ship aecton using wells and pect sh											
Marie Mari					1 1	1 1					S Swar	-						
Marke Mark	ZIONE 38 od od	u Jape owe Chau E Uppe	type and owe Oh u and Pulsaki is chiments	E-commage Enjoy	1 1	1 1		\$300,000 \$240,000	5150 000 unit			10	3 000 000 \$2 400 0	00 \$1500.000 \$	85 714 \$68 571 \$42 85	7 \$111.429 \$8	9 143 \$55 714	
Marie	ZONE 38 of or	owe Chau R	west toppe and owe Ohau tive's and mid-likes tops and owe (% = seek in ====		1 1	1 1		\$200,000 \$150,000	5150 000 unit		0000 eve v	12	2 400 000 S1 800 D	00 S1800000 S	68 571 551 429 551 42	9 589 143 56	6 857 566 857	
Market M				(seed.)		1 0					annual	35						
Column C				Sell clad th eatened spec es	2 2	2 2						35						
Market M	ZONE 22 od od	i Uppe owe Ohau	ake Benno e I lands		1 1	1 1				\$60 000 \$60 000						. , ,.		
Market M			an		0 25	5 10				50 575 000								
Part				is and epacement	0 3	3 15	sia di placement(no)											
The column Column				li a dipair cea ance	45 25	5 8		5231 000 5		\$10 205 000 \$5 775 000		1 5	0 395 000 55 775 0	00 51848000 52				
Second S	ZONE 4 Jechni Jahren			Weed mantenan e - c ea ed a eas	1100 600	190	Weed main enance - clea ed a eac ha) ana i manner org org	\$1700 \$1700	\$1.00 ha	\$1 870 000 \$1 020 000	\$323 000 annual	35 S	S 450 000 S35 700 0	00 \$11305000 \$18	70 000 \$1 020 000 \$323 00	0 \$2.431.000 \$1.32	6 000 S419 900	
Column C	ZONE 4 Jachni ekspo	P	an	ingrittat cl. a ed a eas	1100 600	190	3 605		i Jin	\$78 200 \$42 600		35						
Second Column Col				atcles ed a est	1100 600	2 .		1										
Marcin M	- ton				30 25	5 15	B ack backed gull pieds O clients i e chipio ec using well candipect ich											
Second Control of the Control of t		P	айо Те адо то д пс	Weed management on lake edge	10 10	D 10	West Agents to											
Part	ZONE 4 atches	nest also		Rects at on a wader epheme all habilist in South East and Cauceway	100 100	100	a ionio wade uli abi at n south											
				manag ment	s s	s s	S tespe wa ened per less ma lest											
					1 1	1 0	e) values											
				Forest and en ance e sing call sall es examples a e Wolds Grays success. All file sid user and breads. Maintenant et a sei in			eco al va unt examples			\$600 000 \$300 000		1	1800 000 \$800 0					
An in case Control of the Contro	46.000	ment also C so Kodiau so		FEED ASSESSMENT AND ADDRESS OF	15 15000	15000	T and a mat and knowledge.	\$10 \$10	510 ha	\$150 000 \$150 000	\$150,000 annual on wa	25	3750 000 \$3750 0	00 \$3.750.000 \$1	07143 \$107143 \$10714	3 \$129.286 \$13	9 286 \$129 286	
Mark	akaon	o Soder				6 6	mas or upon and woody weed cost of a ong canal Ca ex ecto at on a one care*											
Control Cont					×	24	edge C est or o next all low											
	ZONE 4 Jackson	da T o forte o mest ala K		connec ed io cara s (un	1 01	_	wet ands connected in care is Carelic innectivity issed and e ist all overebale											
2006.64 attributed and Europe Schwere to Europe			kapor stiment	Application of ey ago.	1 1	1 1	Appication of key indings on knowledge gaps			\$580 000 \$464 000 \$800 000 \$240 000								
Dot A planter at Taylor Extract	ZONE 4 acchor	no ment also Y			7	1 1	Tuna supplemen at or											
Maps Side of an Separate Sidest acceptance			kapor schment		S 1	3 1	Sidest amcarchment											
Annual and Conference Annu				Side st earn ca chine eli c and t out est val	a 2	2 1	O cienale obpoector ucing well and pect of	\$32,000 \$32,000	532 000 unt	\$96 000 \$64 000	\$32,000 once	1	\$96,000 \$64.0	00 \$32,000	52.743 \$1.829 \$91	4 53566 5	2377 \$1189	
		Q	30															

									Sma I mammal	Sma I mammal							We land		ste			Application of key	
Key act ons (Waltaki alues)				is and eplacement	@ idpain	@adpain	Weed m intenance -	Weed main en n e-	p eda o ongo ng	p eda o ongo ng	Sm I mammal	Small mammal	M ck backed gull						at ve	Know edge	Know edge		one ey
	s ands c eat on	Is and c eat on cos s	Is and s epia ement	costs	clea ance	c ea ance costs	cea ed a eas	c ea ed a eas costs	memt at c ea ed	mamt at cea ed	o edato setua costs	a edata setua costs	o edato cont ol	Black backed gull a e		We lands dies ed cos s	es a ed	We lands +	sh Osiena	gaps i led	gaps led colts "	knowledes sags	indin s
			At ul epacement		at 77ha pe km		At slands + b aid p a n								At 1 wet and pe 5 m		At 1		M	At \$30k each		Nom nally at	
Ca cuta ions			ve y 20 yea s (10% pe		4900ha land		n ha at 20% o hab tat		At is ands + b a d		At is ands + b a d				12 pe side 24 in		we land		21300	pe annum o		\$100k each o	
-	At 1 ha each		At \$2000 pe ha		a ea Gkml		a ea c e ted		o ain in ha At 80% o hab tat		o ain in ha At 80% o h b tat		At colonies At \$20,000 pe		to all At 50ha oe		00 S At \$15	a S	9 320 31300	2 was o i a di \$90k		ia ds. shand	
Costs	At \$3000 pe ha		ma ntenance build pe		At \$3000 pe ha				a eac ested At		a ea c eated At		calany per year a S				pe plant		pe	Naive sh			
	c est on		10 years		c eat on		At \$50 per treat diha		200m spacing 9		200m spacine 9		vea s Est mated 10		At \$2000 pe ha dea e	1	0.0		nowm.	590k			
Scena io 1 key act ons is ablish and main ain the biald plain at a late.																	24 240			iza du			
o 2 Skm pe annum ove 24 yea s to achieve 100% o available b a d																	24 240 ha			e et al		A1(200%) o key	
p ain P ov de sandsove 12% o and a ea mmed ate y to secu e																							
th eatened pecies. Re ove a likey-we lands and side st eams as pait o																	2600		00%	nue teb a es		ecomm nda ions	
Soma to 2 key act one Satablish and maintain 20 is ands and 5 x Skm	60 ha	\$180 000	6	\$63 000	43km	\$14 333 000	1450.3	\$3 \$37 96A	3439.3	6373.764	36767	C364 846	100% 10	\$1,000,000	100% 34 36554	C736.66	3 414.	\$360,000	24 MARRIED	-	ccan non	was un	******
se tions o b aid plain 40% o available b aid plain) so that thies ened																	80% 19			iza du			
bild goog ations a eseculed Recover most levi wet ands and lide																	190 ha			e et al		Most (80%) o	
st earns ill knowledge gaps in I za dis and ie lest ill linve leb ates and																	1900			ove teb a es		ecomm nda ions	
at earth 11 knowledge gaps in 12a disand in left i 1 linve leb abes and	- 10	\$90,000		\$31 500	25km	\$5,775,000	2 282	\$1,026,375	1570	\$110 291	1570	\$105 975	80% 8	\$800,000	80% 19 190 ha	\$\$70.00		C207.000.00	% 25 *********			aken up	********
		390 000		311 100	2101	44774000	200.0	41 020 47 8	1000	******	1170	2201 173	AUN A	2800 000	NO. 10 10013	227000		3383 COO 20	~ 21				
Scena io 3 key act one Setab ish and maintain 15 is ands and 4 x 2km																	50% 12			iza de		Highest p is ity	
se tions o exemp a b aid plan incuding weed and p eda o ont of																	120 ha			e et al		50%) o	
Recover key we lands and side at earns ill knowledge gaps in I za ds																	1200			nue teb a es		ecomm nda ions	
and te st allieve teb at s and n native i h management	15	\$45 000	15	\$15.750	Skm	\$1,949,000	189 2	5231 275	507.8	\$25.705	507.8	\$34 277	50% S	\$500,000	50% 12 120 ha	90 0962	al n s	\$180,000 \$0	% 15 memen	sh .	000 0922	akenup	*******

Released under Official Information Act

From: **Richard Maloney**

Ken Hughey; Jo Macpherson To:

Cc: Colin O"Donnell

Subject: Management Zones and management activities for Waitaki catchment for Meridian-Genesis discussions

Just Nect Nect Official Information Red Linder Official Inform

Management Zones and management activities for Waitaki catchment for Meridian/Genesis/DOC discussions

This document is background working information to support the development of concepts and plans for future management of biodiversity values in the Waitaki catchment.

Five management zones are used, covering all of the Waitaki catchment. Zones

ZONE 1: Lower Waitaki below Waitaki dam, including Hakataramea River

ZONE 2: Ahuriri River catchment including side streams (e.g., Omarama, Henburn, Quailburn streams), Benmore Arm of Lake Benmore, and Lakes Aviemore and Waitaki

ZONE 3a: Hopkins, Dobson and Tasman Rivers including Lake Ohau and Lake Pukaki

ZONE 3b: Pukaki, Upper Ohau, Lower Ohau Rivers, including Lake Ruataniwha and Lake Benmore (Tekapo arm), and side streams (e.g., Twizel, Fraser Streams)

ZONE 4: Tekapo River catchment, Lake Tekapo, Godley, Cass, MacAulay Rivers, including side streams (e.g. Forks, Maryburn, Irishmans, Grays, Sawdon, Edwards streams)

Key focal values, management activities and costs are given for each zone below.



elease,

Table 1: Zone names and a summary of the key focus of the work in each zone (note that not all work is indicated in the lists).

(note that	not all work is ind	licated in the lists).
		PC X
ZONE	ZONE NAME	Key focus of work
ZONE 1	Lower Waitaki, Hakataramea	Restoration of braid plains and side streams, wetland enhancement in catchment including fish and tuna habitat, island creation, weed control and targeted predator control, knowledge gaps filled.
ZONE 2	Ahuriri catchment and lower Lakes	Focussed restoration in key exemplar sites on river with associated weed and predator management, some broadscale river weed management, targeted lake edge weed con rol, site specific threatened species management, knowledge gaps filled, wetland enhancement in catchment including fish and tuna habitat, tuna restoration via translocation
ZONE 3A	Hopkins/Dobson, Tasman, Lakes Pukaki and Ohau	Landscape scale predator management in lower river reaches, spot weed control on rivers and adjacent to native values on lakes, site specific threaten d species management, knowledge gaps filled, wetland enhancement in catchment including fish and tuna habitat, tuna restoration via translocation
ZONE 3B	Pukaki, Upper and Lower Ohau Rivers and mid- Lakes	Exemplar sites with predator and weed management in lower river reaches focused on threatened species hotspots, low level weed control adjacent to native values on lakes, side stream restoration, and areas of terrestrial braid plain weeds managed, knowledge gaps filled, wetland enhancement in catchment including fish and tuna habitat, tuna restoration via translocation
ZONE 4	Tekapo catchment, Lake Tekapo, Godley, Cass, MacAulay	Restoration of braid plains and side streams, wetland enhancement in catchment including fish and tuna habitat, island creation, weed control and targeted predator control, knowledge gaps filled. Restoration of Bays on Lake, and of wetlands in catchment. Tuna restoration via translocation, Island restoration, spot weed control on lake edges, canal carex plantings, no-flow wetland areas established adjoining canal.

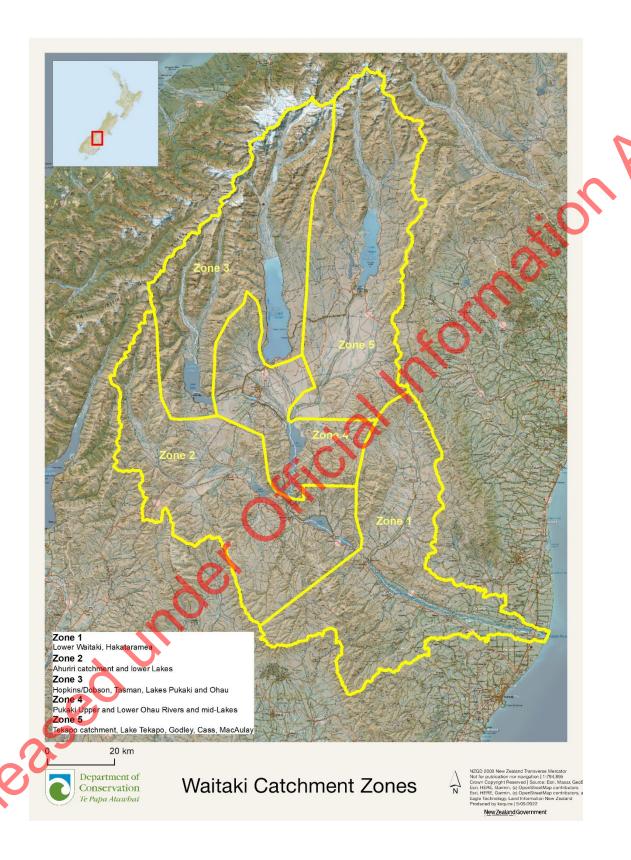


Figure 1: Map of Zones (note that zone 3a and 3b replace Zone 3 and 4 on this map, and zone 5 is now called Zone 4).

Table 2: Average annual **direct costs** for each zone for each of three scenarios. Scenario 1 affords adequate protection and restoration, where nearly all values are thriving. Scenario 2 affords protection and restoration of many values, often in exemplar sites. Scenario 3 affords limited protection and restoration for only some values.

Average annual direct costs Scenario 1

Zone	Zone short name	
ZONE 1	Lower Waitaki, Hakataramea	\$ 3,500,000
ZONE 2	Ahuriri catchment and lower Lakes	\$ 1,000,000
ZONE 3A	Hopkins/Dobson, Tasman, Lakes Pukaki and Ohau	\$ 550,000
ZONE 3B	Pukaki, Upper and Lower Ohau Rivers and mid-Lakes	\$ 1,900,000
ZONE 4	Tekapo catchment, Lake Tekapo, Godley, Cass, MacAulay	\$ 2,950,000
	TOTAL average annual direct cost	\$ 9,950,000

Average annual direct costs Scenario 2

Zone	Zone short name	
ZONE 1	Lower Waitaki, Hakataramea	\$ 1,650,000
ZONE 2	Ahuriri catchment and lower Lakes	\$ 1,000,000
ZONE 3A	Hopkins/Dobson, Tasman, Lakes Pukak and Ohau	\$ 550,000
ZONE 3B	Pukaki, Upper and Lower Ohau Rivers and mid-Lakes	\$ 1,850,000
ZONE 4	Tekapo catchment, Lake Tekapo, Godley, Cass, MacAulay	\$ 1,850,000
	TOTAL average annual direct cost	\$ 6,850,000

Average annual direct costs Scenario 3

Zone	Zone short name	
ZONE 1	Lower Waitaki, Hakataramea	\$ 700,000
ZONE 2	Ahuriri catchment and lower Lakes	\$ 650,000
ZONE 3A	Hopkins/Dobson, Tasman, Lakes Pukaki and Ohau	\$ 500,000
ZONE 3B	Pukaki, Upper and Lower Ohau Rivers and mid-Lakes	\$ 1,250,000
ZONE 4	Tekapo catchment, Lake Tekapo, Godley, Cass, MacAulay	\$ 900,000
	TOTAL average annual direct cost	\$ 3,900,000

Table 3: Average annual direct and indirect costs for each zone for each of three scenarios. Scenario 1 affords adequate protection and restoration, where nearly all values are thriving. Scenario 2 affords protection and restoration of many values, often in exemplar sites. Scenario 3 affords limited protection and restoration for only some values.

Zone	Zone short name	Total
ZONE 1	Lower Waitaki, Hakataramea	\$ 4,550,000
ZONE 2	Ahuriri catchment and lower Lakes	\$ 1,300,000
ZONE 3A	Hopkins/Dobson, Tasman, Lakes Pukaki and Ohau	\$ 700,000
ZONE 3B	Pukaki, Upper and Lower Ohau Rivers and mid-Lakes	\$ 2,450,000
ZONE 4	Tekapo catchment, Lake Tekapo, Godley, Cass, MacAulay	\$ 3,850,000
	TOTAL average annual direct + indirect cost	\$ 12,950,000

Scenario 2 average annual costs (Direct+15%OH+15%contingency)

Zone	Zone short name	X
ZONE 1	Lower Waitaki, Hakataramea	\$ 2,100,000
ZONE 2	Ahuriri catchment and lower Lakes	\$ 1,300,000
ZONE 3A	Hopkins/Dobson, Tasman, Lakes Pukaki and Ohau	\$ 750,000
ZONE 3B	Pukaki, Upper and Lower Ohau Rivers and mid-Lakes	\$ 2,400,000
ZONE 4	Tekapo catchment, Lake Tekapo, Godley, Cass, MacAulay	\$ 2,400,000
	TOTAL average annual direct + indirect cost	\$ 8,900,000

Scenario 3 average annual costs (Direct+15%OH+15%contingency)

_	occinario o a	verage aimadi costs (Direct: 1570011-1570contingency)	
	Zone	Zone short name	
	ZONE 1	Lower Waitaki, Hakataramea	\$ 950,000
	ZONE 2	Ahuriri catchment and lower Lakes	\$ 850,000
	ZONE 3A	Hopkins/Dobson, Tasman, ak s Pukaki and Ohau	\$ 650,000
	ZONE 3B	Pukaki, Upper and Lower Ohau Rivers and mid-Lakes	\$ 1,600,000
	ZONE 4	Tekapo catchment, Lake Tekapo, Godley, Cass, MacAulay	\$ 1,150,000
		TOTAL average annual direct + indirect cost	\$ 5,050,000
2eles	3500		

From: **Richard Maloney** To: Ken Hughey

Subject: Ver_2 Scenarios for levels of value management Tekapo system_SUMMARY.xlsx

Date: Thursday, 5 May 2022 12:45:48 pm

Ver 2 Scenarios for levels of value management Tekapo system SUMMARY.xlsx Attachments:

Costs less than \$10mill for Scenario 1.

New ZONE names added

asheet, plus Mag.

Sheet, plus Mag.

Official Inflormation

Received Linder

Received Linde Some changes to other costs across scenarios to balance this. Most reductions in amount of

Will send a short narrative soon, and will give you this with latest copy of spreadsheet, plus Map

Average annual direct costs Scenario 1

Zone	Zone short name	
ZONE 1	Lower Waitaki, Hakataramea	\$ 3,600,000
ZONE 2	Ahuriri catchment and lower Lakes	\$ 1,050,000
ZONE 3	Hopkins/Dobson, Tasman, Lakes Pukaki and Ohau	\$ 600,000
ZONE 4	Pukaki, Upper and Lower Ohau Rivers and mid-Lakes	\$ 2,450,000
ZONE 5	Tekapo catchment, Lake Tekapo, Godley, Cass, MacAulay	\$ 3,050,000
	TOTAL average annual direct cost	\$ 10,700,000

Average annual direct costs Scenario 2

Zone	Zone short name	
ZONE 1	Lower Waitaki, Hakataramea	\$ 1,650,000
ZONE 2	Ahuriri catchment and lower Lakes	\$ 1,000,000
ZONE 3	Hopkins/Dobson, Tasman, Lakes Pukaki and Ohau	\$ 550,000
ZONE 4	Pukaki, Upper and Lower Ohau Rivers and mid-Lakes	\$ 2,300,000
ZONE 5	Tekapo catchment, Lake Tekapo, Godley, Cass, MacAulay	\$ 1,900,000
	TOTAL average annual direct cost	\$ 7,350,000

Average annual direct costs Scenario 3

Scenario 1 average annual costs (Direct+15%OH+15%contingency)

Zone	Zone short name	Total
ZONE 1	Lower Waitaki, Hakataramea	\$ 4,700,000
ZONE 2	Ahuriri catchment and lower Lakes	\$ 1,400,000
ZONE 3	Hopkins/Dobson, Tasman, Lakes Pukaki and Ohau	\$ 750,000
ZONE 4	Pukaki, Upper and Lower Ohau Rivers and mid-Lakes	\$ 3,200,000
ZONE 5	Tekapo catchment, Lake Tekapo, Godley, Cass, MacAulay	\$ 4,000,000
	TOTAL average annual direct + indirect cost	\$ 13,900,000

Scenario 2 average annual costs (Direct+15%OH+15%contingency)

	8	
Zone	Zone short name	
ZONE 1	Lower Waitaki, Hakataramea	\$ 2,150,000
ZONE 2	Ahuriri catchment and lower Lakes	\$ 1,300,000
ZONE 3	Hopkins/Dobson, Tasman, Lakes Pukaki and Ohau	\$ 750,00
ZONE 4	Pukaki, Upper and Lower Ohau Rivers and mid-Lakes	\$ 3,000,000
ZONE 5	Tekapo catchment, Lake Tekapo, Godley, Cass, MacAulay	\$ 2,450,00
	TOTAL average annual direct + indirect cost	\$ 9,550,000

Scenario 3 av			
Zone	Zone short name		
ZONE 1	Lower Waitaki, Hakataramea	\$	950,000
ZONE 2	Ahuriri catchment and lower Lakes	\$	850,000
ZONE 3	Hopkins/Dobson, Tasman, Lakes Pukaki and Ohau	\$	650,000
ZONE 4	Pukaki, Upper and Lower Ohau Rivers and mid-Lakes	\$	2,800,000
ZONE 5	Tekapo catchment, Lake Tekapo, Godley, Cars, M. cAula	\$	1,200,000
	TOTAL average annual direct + indirect cost	Ś	6.350.000

Sum of Average annual cost S1					
Zone	Zone short name	Total			
ZONE 1	Lower Waitaki, Hakataramea	3,587,814			
ZONE 2	Ahuriri catchment and lower Lakes	1,041,314			
ZONE 3	Hopkins/Dobson, Tasman, Lakes Pukaki and Ohau	574,357			
ZONE 4	Pukaki Upper and Lower Ohau Rivers and mid-Lakes	2,430,586			
ZONE 5	Tekapo catchment, Lake Tekapo, Godley, Cass, MacAulay	3,043,097			
Grand Total		10,677,169			

Sum of Average annual cost S2				
Zone	Zone short name	Total		
ZONE 1	Lower Waitaki, Hakataramea	1,646,326		
ZONE 2	Ahuriri catchment and lower Lakes	992,629		
ZONE 3	Hopkins/Dobson, Tasman, Lakes Pukaki and Ohau	546,214		
ZONE 4	Pukaki Upper and Lower Ohau Rivers and mid-Lakes	2,290,243		
ZONE 5	Tekapo catchment, Lake Tekapo, Godley, Cass, MacAulay	1,865,183		
Grand Total		7.340.594		

Sum of Avera	age annual cost S3	
Zone	Zone short name	Total
ZONE 1	Lower Waitaki, Hakataramea	716,280
ZONE 2	Ahuriri catchment and lower Lakes	633,471
ZONE 3	Hopkins/Dobson, Tasman, Lakes Pukaki and Ohau	481,571
ZONE 4	Pukaki Upper and Lower Ohau Rivers and mid-Lakes	2,146,114
ZONE 5	Tekapo catchment, Lake Tekapo, Godley, Cass, MacAulay	898,583
Grand Total		4,876,020

Sum of S1 annual (Direct+15% OH+15%contingency)		
Zone	Zone short name	Total
ZONE 1	Lower Waitaki, Hakataramea	4,664,159
ZONE 2	Ahuriri catchment and lower Lakes	1,353,709
ZONE 3	Hopkins/Dobson, Tasman, Lakes Pukaki and Ohau	746,664
ZONE 4	Pukaki Upper and Lower Ohau Rivers and mid-Lakes	3,159,761
ZONE 5	Tekapo catchment, Lake Tekapo, Godley, Cass, MacAulay	3,956,026
Grand Total		13.880.319

Zone	Zone short name	Total
ZONE 1	Lower Waitaki, Hakataramea	2,140,223
ZONE 2	Ahuriri catchment and lower Lakes	1,290,417
ZONE 3	Hopkins/Dobson, Tasman, Lakes Pukaki and Ohau	710,0 9
ZONE 4	Pukaki Upper and Lower Ohau Rivers and mid-Lakes	2,977,31
ZONE 5	Tekapo catchment, Lake Tekapo, Godley, Cass, MacAulay	2,424,738
Grand Total		9.542.773

	Grand Total	7,340,594	Grand Total	renapo catalinent, take renapo, dodicy, cass, maeri	9,542,773
	Scenario 3				
	Sum of Average annual cost S3		Sum of S3 annual (Direct+15% OH+15%contingency)		
	Zone Zone short name	Total	Zone	Zone short name	Total
	ZONE 1 Lower Waitaki, Hakataramea ZONE 2 Ahuriri catchment and lower Lakes	716,280 633,471	ZONE 1 ZONE 2	Lower Waitaki, Hakataramea Ahuriri catchment and lower Lakes	931,164 823,513
	ZONE 3 Hopkins/Dobson, Tasman, Lakes Pukaki and Ohau	481,571	ZONE 3	Hopkins/Dobson, Tasman, Lakes Pukaki and O u	626,043
	ZONE 4 Pukaki Upper and Lower Ohau Rivers and mid-Lakes ZONE 5 Tekapo catchment, Lake Tekapo, Godley, Cass, MacAulay	2,146,114 898,583	ZONE 4 ZONE 5	Pukaki Upper and Lower Ohau Rivers and mid-Lak Tekapo catchment, Lake Tekapo, G dley Ca MacAi	
	Grand Total	4,876,020	Grand Total	rekapo catchinent, take rekapo, o diey ca Wiacki	6,338,826
1					
				X	
				•	
			* (\(\sigma^*\)		
			*		
			\(\text{C}\)		
		•			
		X			
		-			
		•			
	_				
i					
•					
V					
	916.0				
•					
1					

The column	The column	The column	Part	Part	Zone one shall A SiyA so zone 20NS 1 NS anne owe Wall all Rive Wall all Rive			a Xwas cost sone Xives cost son Xives out st. Are see ann Are see ann Are see a St. annual Ot e Ω annual Ot schulls OH-15% OH-15% CO	
Part	Mathematical Property of the	Part	Martine Mart	Mathematical Property Service	Hak to sinks	00002		1 5180 000 580 000 541 000 55 141 52 571 51 286 56 886 51 341 51 671 5 5746 000 5176 000 5180 000 521 600 510 800 55 400 528 680 514 680 57 020	\$273,700,900 \$256,900,800 \$170,660,710 25 was a six \$10,677,169 \$7,340,594 \$4,876,000 awe are annual otal
Property Service	Part	Part	Part	Part		Bia dip ain cies ance (km) 62 25 B Bia dip bis i les ance km) 5231 non			
Part	Part	Part	Part	Part			\$1,700 \$1,700 ha \$2,550,000 \$1,000,000 \$340,000 annual 25	\$ 589.250.000 \$15.700.000 \$11.900.000 \$2.550.000 \$1.000.000 \$340.000 \$1.315.000 \$1.315.000 \$443.000	
Part	March Marc	March Marc	Martin M	Part		eigent at cl a ed a eas \$71	\$71 \$71 hs \$206.500 \$42.600 \$14.200 annual 25	\$ \$3.727.500 \$1.492.000 \$497.000 \$306.500 \$42.600 \$14.000 \$138.450 \$55.380 \$18.460	
Part	Part	Part	Part	Part		Black back 4 gu i p eda o cont oi an a garante		, , , , , , , ,	
Part	Part	Part	Part	Part		(so) a supplemental (so) (supplemental (so) (supplemental (so) (supplemental (so) (so) (so) (so) (so) (so) (so) (so)			
This image	This image	This image	Martine Mart	Martine Mart					
March Marc	March Marc	March Marc	March Marc	March Marc		O starture ship otecion using O starture in polection			
Mathematical Control	ZONE 1 Owe Wai all owe Wai all cat hment and Halk to arms Halks a arms	Encodedge gaps i ed 1 1 1 Encodedge gaps i ed SSED DOD							
Mathematical Control	ZONE 1 Owe Wai alii owe Wai alii cat hinert and Halia a arrea	Policiation on this wild right rous 25 21 21 22 Web (c2) on a less wide filter 2500,000							
Professor Prof	Professor Prof	Professor Prof	Professor Prof	Professor Prof		\$200,000	\$150,000 \$150,000 unt \$300,000 \$150,000 eve y3 years 13	\$2,400,000 \$1,800,000 \$1,800,000 \$68,571 \$51,429 \$51,429 \$89,143 \$66,857 \$66,857	
Mathematical Property of the	Mathematical Property of the	Mathematical Property of the	Mathematical Content of the conten	Mathematical Content of the conten		31000	\$1,000 \$1,000 hs \$45,000 \$35,000 \$21,000 ence	1 \$45,000 \$36,000 \$21,000 \$1,286 \$1,029 \$600 \$1,671 \$1,227 \$780	
Mathematical Property of the	Mathematical Property of the	Mathematical Property of the	Mathematical Property of the	Mathematical Property of the	ebu ii				
Part	Part	Part	Mathematical Property of the content of the conte	Mathematical Property of the content of the conte	ebu ii	Weed maintenan e - c ea ed a eas Weed main enance - clea ed			
						Sim il manimal ongo ng piedato 2000 2000 ann piedato inginitat cika ed		\$ \$3.570.000 \$3.570.000 \$3.570.000 \$302.000 \$102.000 \$102.000 \$122.000 \$122.000	
					ZONE 2 Abuli ZONE 2 architect and over Abuli	100 3/1		5 \$7455.000 \$7455.000 \$1988.000 \$212.000 \$212.000 \$56.800 \$276.900 \$276.900 \$77.840	
					ZONE 2 accinent and Ahui i Rive	Black back of av I a eda o cont of		\$1,250,000 \$1,250,000 \$1,250,000 \$28,571 \$28,571 \$28,571 \$50,143 \$50,143 \$50,143	
						We lands cased (ha) 500 80 50 Wet ands case d (a)		t \$600,000 \$480,000 \$300,000 \$17,043 \$13,714 \$8,571 \$22,286 \$17,829 \$11,143	
Mathematical Control of the contro	Mathematical Control of the contro	Mathematical Control			des sier	We lands et o ed plu ting encing 200 80 50 West and sectored plusting that the section of the se	\$1500 \$1500 ha \$550000 \$220000 \$75000 \$yeas	\$ \$750.000 \$600.000 \$275.000 \$21.429 \$17.143 \$10.714 \$27.857 \$22.286 \$13.929	
					Abo size	2000 (0.70)	\$32,000 \$32,000 unt \$320,000 \$256,000 \$360,000 ence	\$ \$200,000 \$256,000 \$460,000 \$9.143 \$7.314 \$4.571 \$11.886 \$9.599 \$5.943	• ()
					Own plans	Enouveled that \$580,000		\$ \$2,900,000 \$2,900,000 \$2,900,000 \$82,857 \$82,857 \$82,857 \$307,714 \$307,714	
					the state of the s	knowledge gaps 5300,000		0 \$3,000,000 \$2,400,000 \$1,500,000 \$85,714 \$68,571 \$42,857 \$111,429 \$89,943 \$55,714	X
					abuli	S200.000 Side or earn ca chimete management S deut annicarchiment		t 52,400,000 51,800,000 51,800,000 568,571 551,429 551,429 589,543 566,857 566,857	
					Muli	(weeds) standard (weeds) \$3,000 Simil framework ones on a endance Simil framework ones ones ones ones ones ones ones ones		; \$105.000 \$105.000 \$0 \$3.000 \$1.000 \$0 \$3.000 \$0	7
						ing il mammal set po educe mgmt 2000 2000 and insul mammal etap p educe (57)	,,, ,,, ,,, ,,,,,,,,,,,,,,,,,,,,,,,,,,,	\$ \$7.455.000 \$7.455.000 \$1.988.000 \$213.000 \$213.000 \$56.600 \$276.900 \$276.900 \$73.840	/ P
					abu ii			5175 000 5140 000 587 500 55 000 54 000 52 500 56 500 51 200	
Mathematical Control of the contro	Mathematical Control of the contro	Mathematical Control of the contro	Mathematical Content of the conten	Mathematical Content of the conten				\$ \$5.250.000 \$5.250.000 \$5.250.000 \$150.000 \$150.000 \$285.000 \$285.000	
Mathematical Control of the contro	Mathematical Control of the contro	Mathematical Control of the contro	Mathematical Control of the contro	Mathematical Control of the contro		Sm. Il manumal pieda o ingine (simo 20 20 0 Sima i manumal piedano ingini (sec) sci cia ed a esc 52.700			
					ukahi and	We lands as o ed pils ting encing 50 30 25 west ands exto ed planting encing (to) \$1,500			
Mathematical Control of the contro	Mathematical Control of the contro	Mathematical Control of the contro	Mathematical Control of the contro	Mathematical Control of the contro	sink and	Weed main researce - clea ed a sec ha) 100 100 100 200 3 200 3 200 3 200 3 200 3 200 51700	\$1700 \$1700 ha \$170000 \$170000 \$170000 annual 35	\$ \$5,950,000 \$5,950,000 \$5,950,000 \$170,000 \$170,000 \$170,000 \$221,000 \$221,000	
Mathematical Control of the contro	Mathematical Control of the contro	Mathematical Control of the contro	Mathematical Control of the contro	Mathematical Control of the contro	skaki sod		\$150,000 \$150,000 unit \$300,000 \$300,000 \$300,000 3 years		
Part	Part	Part			skeld and	Weed management on also			
Column	Column	Column	Column	Column					
Section Sect	Section Sect	Section Sect			and the field of				
Mathematical Control of the contro	Mathematical Control of the contro	Mathematical Control of the contro	Mathematical Control of the contro	Mathematical Control of the contro	sinal and p Kali and Ottal	520000			
Mathematical Contine	Mathematical Contine	Mathematical Contine	Mathematical Contine	Mathematical Control of the contro	ZONE 4 nd owe Ohau owe Ohau kive				
Mathematical Control of the contro	Mathematical Control of the contro	Mathematical Control of the contro	Mathematical Control of the contro	Mathematical Control of the contro	ZONE 4 of owe Ohau owe Ohau Pulia i Rive s	Randonis con provided on or or Randonis inspection			
Part	Part	Part				Weed mannerance - clea ed a east 1000 1000 1000 a eac ha) \$1700			
Mathematical Control of the contro	Mathematical Control of the contro	Mathematical Control of the contro	Mathematical Control of the contro	Mathematical Control of the contro		Equitatic 3 ed 5 eds. \$71	\$71 \$71 km \$213,000 \$542,000 \$71,000 annual 35		
Part	Part	Part	Mathematical Control of the contro	Mathematical Control of the contro	Esa cantino.		568 568 hu 5304000 5136000 568000 Eve y 15 yeu s		
Marie Mari	Marie Mari	Marie Mari	Marie Mari	Marie Mari			\$150,000 \$150,000 unt \$150,000 \$250,000 \$250,000 3 years	\$45 \$0,000 \$450,000 \$12,857 \$12,857 \$12,857 \$16,714 \$16,714	
Part	Marie Mari	Marie Mari	Marie Mari	Part	Rescartor Carteria	S2 000			
Market M	Market M	Market M	Market M	Market M		D case mative inhip otecion using S1500			
Part	Part	Part	Mark	Mark	delition		\$32,000 \$22,000 unt \$128,000 \$64,000 \$22,000 d		
Part	Part	Part	Part	Part	ZONE 4 Ideal Uppe uppe and owe Oh a and Puk				
Part	Part	Part	Part	Part	ZONE 4 ukaki Uppe and owe Ohau R ve c and m-d - kes	conside the Constitution Consti			
Marke Mark	Marke Mark	Marke Mark	Marke Mark	Marke Mark	ZONE 4 nd owe Ohau Ca chinerts	Side ct earn ca cherent management 1 1 0 5 de ct ann carcherent management (weeds) 53,000			
Market M	Marke Mark	Marke Mark	Marke Mark	Marke Mark		Ta ge ed weed maintenance (mio 1 1 1 1 Ta geted wied maintenance (mio or			
Second Content of the content of t	Second Content of the content of t	Second Content of the content of t	Second Content of the content of t	Second Content of the content of t	- Indiana	manag ment (pecie) 4 4 4 spe ies ma agement 530,000		\$1150,000 \$2150,000 \$2150,000 \$90,000 \$90,000 \$117,000 \$117,000 \$117,000	
Market M	Market M	Market M	Market M	Market M	the state of the s			\$ \$1,000,000 \$800,000 \$500,000 \$28,571 \$22,857 \$14,286 \$37,143 \$29,714 \$18,571	
Marked M	Marked M	Marked M	Marked M	Marked M		5200			
Marie and Control of	Marie and Control of	Marie and Control of	Marie and Control of	Marie and Control of		11 310 49 SERVICE \$10 500			
Market M	Market M	Market M	The column Column	The column Column					
Note that the control of the contr	Note that the control of the contr	Note that the control of the contr	Note that the control of the contr	Note that the control of the contr		See that seemen a c c so ad a see to see the seemen a see that seemen and see			
Second Column Col	Second Column Col	Second Column Col	Second Column Second Colum	Second Column Col	pan	rigotato a edu esc \$71			
Second Control Seco	Second Control Seco	Second Control Seco	Second Control Seco	Second Control Seco	ZONES atchment also p a n				
Marie Mari	Marie Mari	Marie Mari	Marie Part	Marie Part	pan	21 25 15 using well and part in			
Marie Mari	Martin M	Martin M	Martin	Mark		Weed management on take edge 10 10 10 10 go special has 5500			
Market M	Market M	Market M	Mark of the first of the firs	Mark of the first of the firs		Institution of the companies of the comp			
Market M	Market M	Market M	Mark of the first of the firs	Mark of the first of the firs		Sile pacific the extensed space or 5 5 5 5 5 5 10 space as ented per section of the contract o	\$30,000 \$30,000 unt \$150,000 \$150,000 \$250,000 annual 35	\$5,250,000 \$5,350,000 \$5,250,000 \$150,000 \$150,000 \$150,000 \$285,000 \$385,000 \$185,000	
Mark Conference Mark Confe	Mary	Mary	Mary	Mark Conference Mark Confe			\$400,000 \$250,000 unit \$500,000 \$400,000 \$250,000 Jyea s	\$ \$1,500,000 \$1,200,000 \$750,000 \$42,857 \$34,286 \$21,429 \$55,734 \$44,571 \$27,857	
Second Control of Co	Second Control of Co	Second Control of Co	Mark	Mark		Ma release is an in the cold second expense. St 500			
Company Comp	Company Comp	Company Comp	Company Comp	Company Comp	4500 50064	7 to 2 to 3	,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,		
Companies Comp	Companies Comp	Companies Comp			ekson fordier	Calex eccustion a ong careal			
Control Cont	Control Cont	Control Cont	Control Cont	Control Cont	skano Sodiar	Cesion o metal on with di			
					skam fodes	Canal connect in ty #5 ind Canal connect in ty is a d and			
					the state of the s				
					ZONES atchment also Y kapoc schment	emerts los 1 1 1 Tura supplementation \$200,000			
2005 2006 2007	2005 2006 2007	2005 2006 2007	2005 2006 2007	2005 2006 2007		Side of an an authorise Side of an accustoment			
				60		Side at each cardway existed 3 2 2 1 stemail existed to 532 excess the section of	\$32,000 \$32,000 unt \$96,000 \$64,000 \$32,000 once 5	1 596.000 \$64.000 \$32.000 \$2.743 \$1.829 \$914 \$3.566 \$2.277 \$1.889	
				100					
		2)	75						
3/0-	3/6	3/2	5						
		3							
	3/6	3							
		3							
3/0	3/6	3/2							

									Small mammal	Sma I mammal							We land		ste			App ics ion o key	Appl cati
Key act ons				is and eplacement	@ idpain	@adpain	Weed m intenance -	Weed main en n e-	p eda o ongo ng	p eda o ongong	Sm I mammal	Small mammal	ill ck backed gull						at ve	Know edge	Know edge		one ey
	s ands c eat on	Is and c wat on cos s	Is and s epia ement	costs	clea ance	c ea ance costs	cea ed a eas	c ea ed a eas costs	memt at c ea ed	mamt at cea ed	o edato setua costs	a edata setua costs	o edato cont oi	Black backed gull a e		We lands dies ed cos s	es a ed	We lands 4	sh Osiena	gaps i led	gaps I ed co ts	knowledge gags	ind n s
			At ul epacement		at 77ha pe km		At slands + b aid p a n								At 1 wet and pe 5 m		At 1		M	At \$30k each		Nom nally at	
Ca cula ions			ve y 10 yea s (10% pe		4900ta land		n ha at 20% o hab tat		At is ands + b a d		At is ands + b a d				12 pe side 24 in		we land		21300	pe annum o		\$100k each o	
-	At 1 ha each		At \$3000 pe ha		a ea 62kml		a ea c e ted		a ain in ha At 80% o hab tat		o ain in ha At 80% o h b tat		At co-onies At \$30,000 pe		to all At 10ha pe		DO S ALSIS	1	ve age 21300	2 was o I a di \$90k		ia ds. shand	
Costs	At \$3000 pe ha		ma ntenance build pe		At \$3000 pe ha				a eac ested At		a ea c eated At		calany pe yea a 5				pe plant		pe	Naive sh			
	c est on		10 vea s		c eat on		At \$50 per treat diha		200m spacing 9		200m spacine 9		vea s Est mated 10		At \$2000 pe ha clea e		D0		nown	\$90k			
Scena io 1 key act ons. So ablish and main ain the biald plain at a late.																	24 240			iza ds			
o 2 Skm pe annum ove 24 yea s to achieve 100% o available b a d																	ha and			e et al		A1(10000) o key	
pain P ov de sands ove 12% o and a ea mmed ate y to secu e																	2600		00%	nue teb a es		ecomm nda ions	
th eatened pecies. Re ove all key we lands and side stleams as pait o	60 ha	\$180,000		SER 000	63km	\$14 222 000	1450.2	52 527 950	2879.7	6323.266	2679.7	5361 846	100% 10	\$1,500,000	100% 24 360.0%	\$220.00		\$360,000	21 ************************************	nue teo a es		ecommings ions	
Soma to 2 key act one. Sixtab ish and maintain 20 is ands and 5 x 5km	6013	2180 000		281 000	L. Fallet	(14.27771881	12017	47427401	24.74.7	(1/1/04	24747	CALCUMA	trans. to	C1 Common	1100. 14 16155	Cramina		2350.000			COMMITTEE	WAS US	
se tions o b aid plan 40% o available b aid plan) so that thiss ened																	80% 19			iza de			
bild goog ations a elseculed Recove most leviwet ands and lide																	190 ha			e et al		Most (80%) o	
st earns ill knowledge gaps in I za du and ie lest il linve leb ates and																	1900			ove teb a es		ecomm nda ions	4
	20	900 000	3	\$31 500	25km	\$5,775,000	2 282	\$1,026,375	1570	\$110 291	1570	\$105 975	80% 8	\$1,200,000	90% 19 190 ha	\$570.00	alns C	\$285,000 8	% 25 #######	sh sh	900 0002	akenup	******
Spena to 3 key act one. Satablish and maintain 15 is ands and 4 x 2km																	50% 12			iza du			
se tions o exempla ib aid plain including weed and oleda ollont of																	120 ha					Highest p is ity 50%) o	
Recover key we lands and side at earns ill knowledge gaps in I za ds																				e et al			
and te st allinye teb at s and ninative i himanagement																	1200			nue teb a es		ecomm nda ions	
and the six active security and intra very intranagement	15	\$45 000	15	\$15.750	Skm	\$1,848,000	189 3	5231 275	507.8	525 705	507.8	\$34 277	2 2002	\$750,000	50% 12 120 ha	5360 00	alns o	\$180,000 \$	% 15 memens	t sh	000 0822	aken up	******

Released under Official Information Act

Average annual direct costs Scenario 1

Zone	Zone short name	
ZONE 1	Lower Waitaki, Hakataramea	\$ 3,500,000
ZONE 2	Ahuriri catchment and lower Lakes	\$ 1,000,000
ZONE 3A	Hopkins/Dobson, Tasman, Lakes Pukaki and Ohau	\$ 550,000
ZONE 3B	Pukaki, Upper and Lower Ohau Rivers and mid-Lakes	\$ 1,900,000
ZONE 4	Tekapo catchment, Lake Tekapo, Godley, Cass, MacAulay	\$ 2,950,000
	TOTAL average annual direct cost	\$ 9,950,000

Average annual direct costs Scenario 2

		_	
Zone	Zone short name		
ZONE 1	Lower Waitaki, Hakataramea	\$	1,650,000
ZONE 2	Ahuriri catchment and lower Lakes	\$	1,000,000
ZONE 3A	Hopkins/Dobson, Tasman, Lakes Pukaki and Ohau	\$	550,000
ZONE 3B	Pukaki, Upper and Lower Ohau Rivers and mid-Lakes	\$	1,850,000
ZONE 4	Tekapo catchment, Lake Tekapo, Godley, Cass, MacAulay	\$	1,850,000
	TOTAL average annual direct cost	\$	6,850,000

Average annual direct costs Scenario 3

Zone Zone short name ZONE 2 Abrurin catchment and lower Lakes \$ 650,000	Zone short name ZONE 1 Lower Waitaki, Hakataramea \$ 700,000 ZONE 2 Ahuriri catchment and lower Lakes \$ 650,000 ZONE 3A Hopkins/Dobson, Tasman, Lakes Pukaki and Ohau \$ 500,000 ZONE 3B Pukaki, Upper and Lower Ohau Rivers and mid-Lakes \$ 1,250,000 ZONE 3B Pukaki, Upper and Lower Ohau Rivers and mid-Lakes \$ 1,250,000 ZONE 4 Tekapo catchment, Lake Tekapo, Godley, Cass, MacAulay \$ 900,000	nnual direct costs Scenario 3		Scenario 3	average annual costs (Direct+15%OH+15%continger
ZONE 1 Lower Waltaki, Hakatramea S 700,000 ZONE 2 Aburit catchment and lower Lakes S 60,000 ZONE 3A Hopkins/Dobson, Tsaman, Lakes Pukaki and Ohau S 500,000 ZONE 3B Pukaki, Upper and Lower Ohau Rivers and mid-Lakes S 1,20,000 ZONE 4 Tekapo catchment, Lake Tekapo, Godley, Cass, MacAulay S 900,000 TOTAL average annual direct cost S 3,900,000 TOTAL average annual direct cost S 3,000,000 TOTAL average annual direct cost S 3,000,000 TOTAL average annual direct cost S 3,000,000 TOTAL average annual direct S 1,000,000 TOTAL average annual direct S 1,000,000,000 TOTAL average annual direct S 1,000,000 TOTAL average annual d	ZONE 1 Lower Waltaki, Hakataramea 5 700,000 (20NE 3A Hopkins/Dobson, Tasman, Lakes Pukaki and Ohau 5 500,000 (20NE 3A Hopkins/Dobson, Tasman, Lakes Pukaki and Ohau 5 500,000 (20NE 3A Hopkins/Dobson, Tasman, Lakes Pukaki and Ohau 5 900,000 (20NE 3A Hopkins/Dobson, Tasman, Lakes Pukaki and Ohau 5 900,000 (20NE 3A Hopkins/Dobson, Tasman, Lakes Pukaki and Ohau 5 900,000 (20NE 3A Hopkins/Dobson, Tasman, Lakes Pukaki and Ohau 5 900,000 (20NE 3A Hopkins/Dobson, Tasman, Lakes Pukaki and Ohau 5 900,000 (20NE 3A Hopkins/Dobson, Tasman, Lakes Pukaki and Ohau 5 900,000 (20NE 3A Hopkins/Dobson, Tasman, Lakes Pukaki and Ohau 5 900,000 (20NE 3A Hopkins/Dobson, Tasman, Lakes Pukaki and Ohau 5 900,000 (20NE 3A Hopkins/Dobson, Tasman, Lakes Pukaki and Ohau 5 900,000 (20NE 3A Hopkins/Dobson, Tasman, Lakes Pukaki and Ohau 5 900,000 (20NE 3A Hopkins/Dobson, Tasman, Lakes Pukaki and Ohau 5 900,000 (20NE 3A Hopkins/Dobson, Tasman, Lakes Pukaki and Ohau 5 900,000 (20NE 3A Hopkins/Dobson, Tasman, Lakes Pukaki and Ohau 5 900,000 (20NE 3A Hopkins/Dobson, Tasman, Lakes Pukaki and Ohau 5 900,000 (20NE 3A Hopkins/Dobson, Tasman, Lakes Pukaki and Ohau 5 900,000 (20NE 3A Hopkins/Dobson, Tasman, Lakes Pukaki and Ohau 5 900,000 (20NE 3A Hopkins/Dobson, Tasman, Lakes Pukaki and Ohau 5 900,000 (20NE 3A Hopkins/Dobson, Tasman, Lakes Pukaki and Ohau 5 900,000 (20NE 3A Hopkins/Dobson, Tasman, Lakes Pukaki and Ohau 5 900,000 (20NE 3A Hopkins/Dobson, Tasman, Lakes Pukaki and Ohau 5 900,000 (20NE 3A Hopkins/Dobson, Tasman, Lakes Pukaki and Ohau 5 900,000 (20NE 3A Hopkins/Dobson, Tasman, Lakes Pukaki and Ohau 5 900,000 (20NE 3A Hopkins/Dobson, Tasman, Lakes Pukaki and Ohau 5 900,000 (20NE 3A Hopkins/Dobson, Tasman, Lakes Pukaki and Ohau 5 900,000 (20NE 3A Hopkins/Dobson, Tasman, Lakes Pukaki and Ohau 5 900,000 (20NE 3A Hopkins/Dobson, Tasman, Lakes Pukaki and Ohau 5 900,000 (20NE 3A Hopkins/Dobson, Tasman, Lakes Pukaki and Ohau 5 900,000 (20NE 3A Hopkins/Dobson, Tasman, Lakes Pukaki and Ohau 5 900,000 (20NE 3A Hopkins/Dobson, Tasman, Lakes Pukaki and Oh				
ZONE 2 Aburir catchment and lower Lakes ZONE 3 Pukaki, Upper and Lower Ohau Rivers and mid-Lakes ZONE 4 Tekapo catchment, Lake Tekapo, Godley, Cass, MacAulay TOTAL average annual direct cost TOTAL average annual direct cost ZONE 3 Super Aburir (atchment and lower Lakes) ZONE 4 Tekapo catchment, Lake Tekapo, Godley, Cass, MacAulay Super Aburir (atchment and lower Lakes) ZONE 3 Pukaki, Upper and Lower Ohau Rivers and mid-Lakes ZONE 4 Tekapo catchment, Lake Tekapo, Godley, Cass, MacAulay ZONE 3 Super Aburir (atchment and lower Lakes) ZONE 3 Pukaki, Upper and Lower Ohau Rivers and mid-Lakes ZONE 4 Tekapo catchment, Lake Tekapo, Godley, Cass, MacAulay ZONE 3 Super Aburir (atchment and lower Lakes) ZONE 3 Pukaki, Upper and Lower Ohau Rivers and mid-Lakes ZONE 4 Tekapo catchment, Lake Tekapo, Godley, Cass, MacAulay ZONE 3 Super Aburir (atchment and lower Lakes) ZONE 3 Hopking/Dobson, Tasman, Lakes Pukaki and Ohau ZONE 3 Pukaki, Upper and Lower Ohau Rivers and mid-Lakes ZONE 4 Tekapo catchment, Lake Tekapo, Godley, Cass, MacAulay ZONE 4 Tekapo catchment, Lake Tekapo, Godley, Cass, MacAulay ZONE 4 Tekapo catchment, Lake Tekapo, Godley, Cass, MacAulay ZONE 4 Tekapo catchment, Lake Tekapo, Godley, Cass, MacAulay ZONE 4 Tekapo catchment, Lake Tekapo, Godley, Cass, MacAulay ZONE 4 Tekapo catchment, Lake Tekapo, Godley, Cass, MacAulay ZONE 5 Pukaki, Upper and Lower Ohau Rivers and mid-Lakes ZONE 6 Tekapo catchment, Lake Tekapo, Godley, Cass, MacAulay ZONE 7 Tekapo catchment, Lake Tekapo, Godley, Cass, MacAulay ZONE 8 Pukaki, Upper and Lower Ohau Rivers and mid-Lakes ZONE 9 Pukaki, Upper and Lower Ohau Rivers and mid-Lakes ZONE 9 Tekapo catchment, Lake Tekapo, Godley, Cass, MacAulay ZONE 9 Pukaki, Upper and Lower Ohau Rivers and mid-Lakes ZONE 9 Pukaki, Upper and Lower Ohau Rivers and mid-Lakes ZONE 9 Tekapo Catchment, Lake Tekapo Catchment, L	ZONE 2 Abrufic acthement and lower Lakes S 650,000 ZONE 3A Hopkins/Dobton, Tarman, Lakes Pulaki and Ohau S 500,000 ZONE 3B Pulaki, Upper and Lower Ohau Rivers and mid-Lakes S 1,250,000 ZONE 4 Telapo cathement, Lake Telapo, Codley, Cass, MacAulay S 900,000 TOTAL average annual direct cost		\$ 700,000		
ZONE 3A Hopkins/Dobson, Tasman, Lakes Pukaki and Ohau \$ 500,000 ZONE 4 Tekapo catchment, Lake Tekapo, Godley, Cass, MacAulay \$ 900,000 ZONE 4 Tekapo catchment, Lake Tekapo, Godley, Cass, MacAulay \$ 3,300,000 TOTAL average annual direct cost \$ 3,300,000 TOTAL average annual direct cost \$ 7,000 TOTAL average annual direct \$ 7,000 TOTAL ave	ZONE 3A Hopkins/Dobson, Tasman, Lakes Pukaki and Ofhau \$ 5,00,000				
ZONE 4 Tekapo catchment, Lake Tekapo, Godley, Cass, MacAulay S 900,000 TOTAL average annual direct cost S 3,900,000 TOTAL average annual direct cost S 3,900,000	ZONE 4 Telapo catchment, Lake Telapo, Godley, Cass, MacAulay \$ 3,000,000 ZONE 4 Telapo catchment, Lake Telapo, Godley, Cass, MacAulay \$ 3,000,000 ZONE 4 Telapo catchment, Lake Telapo, Godley, Cass, MacAulay \$ 3,000,000 ZONE 4 Telapo catchment, Lake Telapo, Godley, Cass, MacAulay \$ 3,000,000 ZONE 4 Telapo catchment, Lake Telapo, Godley, Cass, MacAulay \$ 3,000,000 ZONE 4 Telapo catchment, Lake Telapo, Godley, Cass, MacAulay \$ 3,000,000 ZONE 4 Telapo catchment, Lake Telapo, Godley, Cass, MacAulay \$ 3,000,000 ZONE 4 Telapo catchment, Lake Telapo, Godley, Cass, MacAulay \$ 3,000,000 ZONE 4 Telapo catchment, Lake Telapo, Godley, Cass, MacAulay \$ 3,000,000 ZONE 4 Telapo catchment, Lake Telapo, Godley, Cass, MacAulay \$ 3,000,000 ZONE 4 Telapo catchment, Lake Telapo, Godley, Cass, MacAulay \$ 3,000,000 ZONE 4 Telapo catchment, Lake Telapo, Godley, Cass, MacAulay \$ 3,000,000 ZONE 4 Telapo catchment, Lake Telapo, Godley, Cass, MacAulay \$ 3,000,000 ZONE 4 Telapo catchment, Lake Telapo, Godley, Cass, MacAulay \$ 3,000,000 ZONE 4 Telapo catchment, Lake Telapo, Godley, Cass, MacAulay \$ 3,000,000 ZONE 4 Telapo catchment, Lake Telapo, Godley, Cass, MacAulay \$ 3,000,000 ZONE 4 Telapo catchment, Lake Telapo, Godley, Cass, MacAulay \$ 3,000,000 ZONE 4 Telapo catchment, Lake Telapo, Godley, Cass, MacAulay \$ 3,000,000 ZONE 4 Telapo catchment, Lake Telapo, Godley, Cass, MacAulay \$ 3,000,000 ZONE 4 Telapo catchment, Lake Telapo, Godley, Cass, MacAulay \$ 3,000,000 ZONE 4 Telapo catchment, Lake Telapo, Godley, Cass, MacAulay \$ 3,000,000 ZONE 5 Telapo catchment, Lake Telapo, Godley, Cass, MacAulay \$ 3,000,000 ZONE 6 Telapo catchment, Lake Telapo, Godley, Cass, MacAulay \$ 3,000,000 ZONE 6 Telapo catchment, Lake Telapo, Godley, Cass, MacAulay \$ 3,000,000 ZONE 7 Telapo catchment, Lake Telapo, Godley, Cass, MacAulay \$ 3,000,000 ZONE 6 Telapo catchment, Lake Telapo, Godley, Cass, MacAulay \$ 3,000,000 ZONE 7 Telapo catchment, Lake Telapo, Cass, MacAulay \$ 3,000,000 ZONE 7 Telapo catchment, Lake Telapo, Cass, MacAulay \$ 3				
ZONE 4 Tekapo catchment, Lake Tekapo, Godley, Cass, MacAulay \$ 900,000 TOTAL average annual direct cost \$ 3,900,000 TOTAL average annual direct indirect cost \$ 700	Total average annual direct cost S 3,300,000 Total average annual direct cost S 3,300,000 Total average annual direct indirect cost S S S S S S S S S				Pukaki, Upper and Lower Ohau Rivers and mid-Lakes
TOTAL average annual direct cost S 3,900,000 TOTAL average annual direct + indirect cost O 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1	TOTAL average annual direct cost TOTAL average annual direct + indirect + i				Tekapo catchment, Lake Tekapo, Godley, Ca s, M cA
ad under Official Inform	ased under official inform				
		cedund	O	ici (

Scenario 1 average annual costs (Direct+15%OH+15%contingency)

Zone	Zone short name	Total
ZONE 1	Lower Waitaki, Hakataramea	\$ 4,550,000
ZONE 2	Ahuriri catchment and lower Lakes	\$ 1,300,000
ZONE 3A	Hopkins/Dobson, Tasman, Lakes Pukaki and Ohau	\$ 700,000
ZONE 3B	Pukaki, Upper and Lower Ohau Rivers and mid-Lakes	\$ 2,450,000
ZONE 4	Tekapo catchment, Lake Tekapo, Godley, Cass, MacAulay	\$ 3,850,000
	TOTAL average annual direct + indirect cost	\$ 12,950,000

Scenario 2 average annual costs (Direct+15%OH+15%contingency)

Zone	Zone short name	
ZONE 1	Lower Waitaki, Hakataramea	\$ 2,100,000
ZONE 2	Ahuriri catchment and lower Lakes	\$ 1,300,000
ZONE 3A	Hopkins/Dobson, Tasman, Lakes Pukaki and Ohau	\$ 750,00
ZONE 3B	Pukaki, Upper and Lower Ohau Rivers and mid-Lakes	\$ 2,400,000
ZONE 4	Tekapo catchment, Lake Tekapo, Godley, Cass, MacAulay	\$ 2,400,00
	TOTAL average annual direct + indirect cost	\$ 8,900,000

Scenario 3 ave	erage aimual costs (Direct+15%OH+15%contingency)	_	
Zone	Zone short name		
ZONE 1	Lower Waitaki, Hakataramea	\$	950,000
ZONE 2	Ahuriri catchment and lower Lakes	\$	850,000
ZONE 3A	Hopkins/Dobson, Tasman, Lakes Pukaki and Ohau	\$	650,000
ZONE 3B	Pukaki, Upper and Lower Ohau Rivers and mid-Lakes	\$	1,600,000
ZONE 4	Tekapo catchment, Lake Tekapo, Godley, Ca s, M cAula	\$	1,150,000
	TOTAL average annual direct + indirect cost	Ś	5.050.000

age annual cost S1		Sum of S1 annual	(Direct 15% OH 15%contingency)			
Zone short name	Total	Zone	Zone short name	Total		
Lower Waitaki Hakataramea	3 531 757	ZONE 1	Lower Waitaki Hakataramea	4 591 284	3531757.14 4591284.29	350
Ahuriri catchment and lower Lakes	1 028 457	ZONE 2	Ahuriri catchment and lower Lakes	1 336 994	1028457.14 1336994.29	100
Hopkins/Dobson Tasman Lakes Pukaki and Ohau	574 357	ZONE 3A	Hopkins/Dobson Tasman Lakes Pukaki and Ohau	746 664	574357.143 746664.286	55
Pukaki Upper and Lower Ohau Rivers and mid-Lakes	1 900 379	ZONE 3B	Pukaki Upper and Lower Ohau Rivers and mid-Lakes	2 470 492	1900378.57 2470492.14	190
Tekapo catchment Lake Tekapo Godley Cass MacAulay	2 962 383	ZONE 4	Tekapo catchment Lake Tekapo Godley Cass MacAulay	3 851 098	2962382.86 3851097.71	295
	9,997,333	Grand Total		12,996,533	9997332.86 12996532.7	995
	Zone short name	Zone short name Total Lower Waltaki Hakataramea 3 531 757 Ahuriri catchment and lower Lakes 1 028 457 Hopkins/Dobson Tasman Lakes Pukaki and Ohau 574 357 Pukaki Upper and Lower Ohau Rivers and mild-Lakes 1 900 379 Tekapo catchment Lake Tekapo Godley Cass MacAulay 2 962 383	Zone short name Total Zone Lower Waltaki Hakataramea 3 531 757 ZONE 1 Ahuriri catchment and lower Lakes 1 028 457 ZONE 2 Hopkins/Dobson Tasman Lakes Pukaki and Ohau 57 4 357 ZONE 3A Pukaki Upper and Lower Ohau Rivers and mid-Lakes 1 900 379 ZONE 3B Tekapo catchment Lake Tekapo Godley Cass MacAulay 2 962 383 ZONE 4	Zone short name Total Zone Zone short name Lower Waltaki Hakataramea 3 531 757 ZONE 1 Lower Waltaki Hakataramea Abruiri catchment and lower Lakes 1 028 457 ZONE 2 Abruiri catchment and lower Lakes Hopkins/Dobson Tasman Lakes Pukaki and Ohau 574 357 ZONE 3A Hopkins/Dobson Tasman Lakes Pukaki and Ohau Pukaki Upper and Lower Ohau Rivers and mid-Lakes 1 900 379 ZONE 3B Pukaki Upper and Lower Ohau Rivers and mid-Lakes Tekapo catchment Lake Tekapo Godley Cass MacAulay 2 962 383 ZONE 4 Tekapo catchment Lake Tekapo Godley Cass MacAulay	Zone short name Total Zone short name Zone short name Total Lower Waltaki Hakataramea 3 531 757 ZONE 1 Lower Waltaki Hakataramea 4 591 284 Ahuriri catchment and lower Lakes 1 028 457 ZONE 2 Ahuriri catchment and lower Lakes 1 336 994 Hopkins/Dobson Tasman Lakes Pukaki and Ohau 574 357 ZONE 3A Hopkins/Dobson Tasman Lakes Pukaki and Ohau 746 664 Pukaki Upper and Lower Ohau Rivers and mid-Lakes 1 900 379 ZONE 3B Pukaki Upper and Lower Ohau Rivers and mid-Lakes 2 470 492 Tekapo catchment Lake Tekapo Godley Class MacAulay 2 962 383 ZONE 4 Tekapo catchment Lake Tekapo Godley Class MacAulay 3 851 098	Zone short name Total Zone short name Zone short name Total Lower Waltaki Hakataramea 3 531 757 ZONE 1 Lower Waltaki Hakataramea 4 591 284 351757.14 4 591284.29 Hopkins/Dobson Tasman Lakes Pukaki and Ohau 574 357 ZONE 3 Hopkins/Dobson Tasman Lakes Pukaki and Ohau 746 664 574357.143 746664 286 Pukaki Upper and Lower Ohau Rivers and mid-Lakes 1900 379 2ONE 3 Pukaki Upper and Lower Ohau Rivers and mid-Lakes 2 470 492 14 74921.14 Tekapo catchment Lake Tekapo Godley Cass MacAulay 2 962 383 20NE 4 Tekapo catchment Lake Tekapo Godley Cass MacAulay 3 851 089 2962 382.86 881907.71

Sum of Avera	ge annual cost S2		Sum of S2 annual	(Direct 15% OH 15%contingency)					
Zone	Zone short name	Total	Zone	Zone short name	Total				
ZONE 1	Lower Waitaki Hakataramea	1 612 040	ZONE 1	Lower Waitaki Hakataramea	2 095 652	1612040	2095652	1650000	2100000
ZONE 2	Ahuriri catchment and lower Lakes	979 771	ZONE 2	Ahuriri catchment and lower Lakes	1 273 703	979771.429	1273702.86	1000000	1300000
ZONE 3A	Hopkins/Dobson Tasman Lakes Pukaki and Ohau	546 214	ZONE 3A	Hopkins/Dobson Tasman Lakes Pukaki and Ohau	710 079	546214.286	710078.571	550000	750000
ZONE 3B	Pukaki Upper and Lower Ohau Rivers and mid-Lakes	1 841 493	ZONE 3B	Pukaki Upper and Lower Ohau Rivers and mid-Lakes	2 393 941	1841492.86	2393940.71	1850000	2400
ZONE 4	Tekapo catchment Lake Tekapo Godley Cass MacAulay	1 839 469	ZONE 4	Tekapo catchment Lake Tekapo Godley Cass MacAulay	2 391 309	1839468.57	2391309.14	1850000	24000
Grand Total		6,818,987	Grand Total		8,864,683	6818987.14	8864683.29	6850000	8900000

ZONE 3B	Pukaki Upper and Lower Ohau Rivers and mid-Lakes	1 841 493	ZONE 3B	Pukaki Upper and Lower Ohau Rivers and mid-Lakes	2 393 941	1841492.86 239	3940.71 1850000	
ZONE 4	Tekapo catchment Lake Tekapo Godley Cass MacAulay	1 839 469	ZONE 4	Tekapo catchment Lake Tekapo Godley Cass MacAulay		1839468.57 239		
Grand Total		6,818,987	Grand Total		8,864,683	6818987.14 886	4683.29 6850000	8900000
								\
	Scenario 3							
	rage annual cost \$3	Total		Direct 15% OH 15%contingency)	Total		4	
Zone ZONE 1	Zone short name Lower Waitaki Hakataramea	Total 694 851	Zone ZONE 1	Zone short name Lower Waitaki Hakataramea	Total 903 307	694851.429 903	306.857 0 00	950000
ZONE 2	Ahuriri catchment and lower Lakes	620 614	ZONE 2	Ahuriri catchment and lower Lakes	806 799	620614.286 806	798 571 6500 0	850000
ZONE 3A	Hopkins/Dobson Tasman Lakes Pukaki and Ohau	481 571	ZONE 3A	Hopkins/Dobson Tasman Lakes Pukaki and Ohau	626 043	481571.429 626	042.857 500000	650000
	Pukaki Upper and Lower Ohau Rivers and mid-Lakes	1 200 564	ZONE 3B	Pukaki Upper and Lower Ohau Rivers and mid-Lakes		1200564.29 156		
ZONE 4 Grand Total	Tekapo catchment Lake Tekapo Godley Cass MacAulay	872 869 3,870,470	ZONE 4 Grand Total	Tekapo catchment Lake Tekapo Godley Cass MacAulay		872868.857 113 3870470.29 503		
Grand Total		3,870,470	Grand Total		3,031,011	3870470.23 303	3500000	3030000
						•		
					<i>,</i> \			
				· · · · · · · · · · · · · · · · · · ·				
				* (\(\Lambda\)				
				/X \				
				XX				
		_						
		ZK						
		, i						
	-							
	•							
	30.50							

Part	Part	Mathematical Content of the conten	Mathematical Content of the conten	Mathematical Content of the conten	Mathematical Content of the conten	Mathematical Content of the conten	Part	Mathematical Content of the conten	Zone one shot A Siy A ea ame 20NE 1 Not To Jones Over Wollaki Nove	Scena io 2 Scena io 2 Scena io 2 Scena io 3 Standa in 1 Scena io 3 Scena io 3 Standa io 3 Standa io 3 Scena io 3 Standa io 3 Standa io 3 Scena io 3 Standa io 3 Sta		to a Zives cost scre 'Zives cost scr 'Zives oots' Ave are arn Ave are arn Ave are a SI annual Di e SI annual Di SI annual Di est-15% CH-12%	
Part	Martine Mart	Manual Control	Manual Control	Mathematical Content of the conten	Mathematical Content of the conten	Martin	Mathematical Property of the	Part	HISK DI SINGS	is and epacement no) 6 3 15 six di placement (no)		1 5180 000 500 000 545 000 55 143 52 571 51 286 56 686 53 343 51 671 2 5756 000 5176 000 5180 000 521 600 510 600 55 400 528 080 54 040 57 020	\$349.005.650 \$228.664.550 \$125.465.460 25 was o als \$9.907.223 \$6.818.967 \$2.870.470 ave are around obal
Part	Part	Part	Part	Mathematical Control of the contro	Property Service	Mathematical Control of the contro	Part	Property Service				1 512860000 55775000 51848000 5286000 5165000 552800 5514800 5214500 568640	
Part	Part	Part	Part	Mathematical Control of Control	Part	Mathematical Property of the	Part	Part				S \$89.250.000 \$35.700.000 \$11.900.000 \$2.550.000 \$1.000.000 \$340.000 \$1.315.000 \$1.236.000 \$442.000	
March Marc	March Marc	March Marc	March Marc	March Marc	March Marc	Manual Control	Mathematical Content	Mathematical Content		riginitat di aleda eas	\$71 \$71 \$71 hs \$106 500 \$42 600 \$14 200 annual :		
Mathematical Content of the conten	Mathematical Content of the conten	Mathematical Control of Control	Mathematical Control of Control	Mathematical Content of the conten	Mathematical Content of the conten	Mathematical Content of the conten	Mathematical Content of the conten	Mathematical Content of the conten		at clies and a set up y was or eight 2500 600 200 right at cas and a set and		, ,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,	
Part	Part	The column	The column	Part	Part	Part	Part	Part					
Mathematical Control	Mathematical Control	Mathematical Control	Mathematical Control	Mathematical Control									
Mathematical Control	Mathematical Property of the content of the conte	Mathematical Property of the content of the conte	Mathematical Property of the content of the conte	Mathematical Property of the content of the conte	Mathematical Control	Mathematical Content of the conten	Mathematical Content of the conten	Mathematical Content of the conten		O stream we ship onccion using all 25 to using well and pert at embalding 31 25 to using well and pert of embalding 1 and 25 to second for a many	\$22,000 \$22,000 \$22,000 unt \$992,000 \$800,000 \$480,000 ence		
Mathematical Control	Mathematical Control	Martin	Martin	Mathematical Control	Mathematical Control	March Marc	March Marc	March Marc		Enow eage gaps: 1 ea	\$580,000 \$580,000 \$580,000 unit \$580,000 \$580,000 \$580,000 \$ was a	S 52,900,000 52,900,000 52,900,000 582,857 582,857 582,857 5927,714 5927,714 5927,714	
Mathematical Control	Mathematical Control	Mathematical Control	Mathematical Control of the contro	Mathematical Control of the contro		on knowledge gaps	\$ \$200,000 \$240,000 \$150,000 unit \$200,000 \$340,000 \$150,000 30 years	0 \$3,000,000 \$2,400,000 \$1,500,000 \$85,714 \$68,571 \$42,857 \$111,429 \$89,143 \$55,714					
Martine Mart	Mathematical Property of the	Martine Mart	Martine Mart	Mathematical Control of Control	Martine Mart	Martine Mart	Martine Mart	Martine Mart			\$200,000 \$150,000 \$150,000 unit \$200,000 \$150,000 \$150,000 eve y 3 years	2 \$2,400,000 \$1,800,000 \$1,800,000 \$68,571 \$51,429 \$51,429 \$89,643 \$66,857 \$66,857	
Manual Control	Martin	Martin	Martin	Martin	Manual Control	Martin	Martin	Martin	The state of the s				
March Marc	Mathematical Property of the content of the conte	Mathematical Property of the	Mathematical Property of the	Mathematical Property of the content of the conte	March Marc	Martin	Martin	Martin	Musi		□ [
Mathematical Property of the content of the conte	Mathematical Property of the content of the conte	Mathematical Property of the content of the conte	Mathematical Property of the content of the conte	Mathematical Property of the content of the conte	Mathematical Property of the content of the conte	Mathematical Property of the content of the conte	Mathematical Property of the content of the conte	Mathematical Property of the content of the conte	abi ii	Weed maintenan e - c ea ed a eas	\$221000 \$221000 \$221000 km \$683000 \$683000 once		
									ZONE 2 Schmett and owe Abuil			5 515/0000 515/0000 515/0000 512/000 5	· ·
Part						Part	Part		ZONE 2 achiment and owe Ahuii			1	
									Aug. Nine	(no) cont of no)	\$100,000 \$100,000 \$000,000 mrt \$300,000 \$300,000 \$300,000 3 years	3 \$800,000 \$800,000 \$800,000 \$25,714 \$25,714 \$25,714 \$33,429 \$33,429 \$33,429	
									Carl Sint		\$1000 \$1000 \$1000 hs \$200000 \$360000 \$150000 2 years	2 5600.000 \$480.000 \$300.000 \$17.143 \$13.714 \$8.571 \$22.286 \$17.829 \$11.143	
									Own star	the tandor of cled parting enough 200 80 50 met and enough 200 enough 200 cle and it of the pure of th	S1500 \$1500 \$1500 ha \$150000 \$75000 \$980 K	S \$750,000 \$600,000 \$775,000 \$21,429 \$17,143 \$10,714 \$27,857 \$22,286 \$13,929	
Mathematical Control	Mathematical Control	Mathematical Control	Mathematical Control	Mathematical Control	Annual State		32.00 32.00 32.00 011 320.00 320.00 320.00	1 \$120,000 \$156,000 \$160,000 \$9,143 \$7,314 \$4,571 \$11,886 \$9,509 \$5,943	+ () •				
Mathematical Control	Mathematical Control	Mathematical Control	Mathematical Control	Mathematical Control	Owe akes	Enow edge-gaps. Ted		S \$2,900,000 \$2,900,000 \$2,900,000 \$82,857 \$82,857 \$82,857 \$307,714 \$307,714 \$107,714					
									and the second	knowledge gaps om knowledge gaps		0 \$3,000,000 \$2,400,000 \$1,500,000 \$85,714 \$68,571 \$42,857 \$111,429 \$89,943 \$55,714	X
Mathematical Control	Mathematical Control	Mathematical Control	Mathematical Control	Mathematical Control	abu ii	Side of earning chiment management 1 1 0 Side of an outstanding		5 \$105,000 \$155,000 \$0 \$1,000					
									Mari			5 \$7455.000 \$7455.000 \$1,988.000 \$211.000 \$50 \$210.00 \$0 \$1.000 \$0 \$0 \$1.000 \$0 \$0 \$1.000 \$0 \$0 \$1.000 \$0 \$0 \$1.000 \$0 \$0 \$1.000 \$0 \$0 \$1.000 \$0 \$0 \$1.000 \$0 \$0 \$0 \$0 \$0 \$0 \$0 \$0 \$0 \$0 \$0 \$0	
									ZONE 2 Architect and Toppe Ahu i i	Sin. Il manural set p.p. eduto inget. 3000 3000 800 Sina i manural etap p.a atche edu ess.	to a SEB SEB SEB ha \$204.000 \$204.000 \$64.400 Eve y 15 years	3	
										this greed weed maintenance (mo so	5500 5500 \$500 km \$5.000 \$4.000 \$2.500 annual :	S \$175,000 \$140,000 \$87,500 \$5,000 \$4,000 \$2,500 \$6,500 \$5,200 \$1,35	
Mathematical Control of the contro	Mathematical Control of the contro	Mathematical Control of the contro	Mathematical Control of the contro	Mathematical Continue	Mathematical Control of the contro	Mathematical Control of the contro	Mathematical Control of the contro	Mathematical Control of the contro		nanag ment(pecie) 5 5 5 spe ies na agement		S \$5.250.000 \$5.250.000 \$5.250.000 \$150.000 \$150.000 \$150.000 \$205.000 \$205.000	
						Part	Part	Part		I nec) at cea ed a eac	\$2,700 \$2,700 \$2,700 km \$54,000 \$54,000 \$0 annual		
Part	Part	Part	Part	Part	Part	Part	Part	Part	ukski and	we take et o ed pla ting encing 50 20 25 Wet take eccoled plant encing (tai)	\$1500 \$1500 \$1500 ha \$75,000 \$45,000 \$27,500 \$984 t		
Mathematical Property of the	Mathematical Property of the	Mathematical Control of the contro	Mathematical Control of the contro	Mathematical Property of the	Mathematical Property of the	Mathematical Property of the	Mathematical Property of the	Mathematical Property of the	shall and				
Marie Mari	Marie Mari	Mathematical Control of the contro	Mathematical Control of the contro	Marie Mari	Marie Mari	Marie Mari	Marie Mari	Marie Mari	sink and		\$150,000 \$150,000 \$150,000 unit \$300,000 \$300,000 \$300,000 3 years		
Mathematical Registration	Mathematical Registration	Mathematical Control of the contro	Mathematical Control of the contro	Mathematical Registration	Mathematical Registration	Martin	Martin	Martin	aboli and	water per cord a column to the edge 5 3 1 1 Weed countagement on the edge	in the state of th		
Mathematical Control of the contro	Mathematical Control of the contro	Mathematical Control of the contro	Mathematical Control of the contro	Mathematical Control of the contro	Mathematical Control of the contro	Mathematical Control of the contro	Mathematical Control of the contro	Mathematical Control of the contro	ZONE 2A Tacman sizes also the also and also Ohau				
Manual Control	Manual Control	Manual Control	Manual Control	Manual Control	ZONE 3A Tacman alies also Pu alic I land								
Maria	March Marc	March Marc	March Marc	March Marc	Maria	Mathematical Control of the contro	Mathematical Control of the contro	Mathematical Control of the contro	ZONE 2A Tauman also: p kaki and Ohau				
										st and c ea ion (ta) 2 2 2 sia d c eaton ha)	\$1,000 \$1,000 \$1,000 hs \$6,000 \$6,000 \$6,000 ence		
Marie	Mathematical Control of the contro	Mathematical Continue	Mathematical Continue	Mathematical Control of the contro	Marie	Mathematical Control of the contro	Mathematical Control of the contro	Mathematical Control of the contro					
Mathematical Control	Mathematical Control	Mathematical Control of the contro	Part	Mathematical Control	Mathematical Control	Mathematical Control	Mathematical Control	Mathematical Control				1 52310,000 48,000 51,155,000 507,000 552,800 533,000 585,800 568,640 542,000	
Part	Part	Part	Part	Part	Part	Part	Part	Part	deli mer			S 547 600 547 600 \$29 752 000 \$1 360 000 \$1 360 000 \$850 000 \$1 768 000 \$1 768 000	
Part	Part	Part	Part	Part	Part	Part	Part	Part		Sept 21 C 3 ed 3 est 5 est	\$71 \$71 \$71 km \$342,000 \$342,000 \$71,000 annual ;	S 970 000 70 000 85 000 \$142 000 \$142 000 \$71 000 \$184 600 \$184 600 \$82 300	
Mathematical Control of the contro	Mathematical Control of the contro	Mathematical Control of the contro	Mathematical Control of the contro	Mathematical Control of the contro	Mathematical Control of the contro	Mathematical Control of the contro	Mathematical Control of the contro	Mathematical Control of the contro					
Manual Parameter	Manual Parameter	Manual Parameter	Manual Parameter	Market M	Manual Parameter	Manufact	Manufact	Manufact	ZONE 38 od owe Ohas Uppe and owe Oh s and Put	We lands cea ed (ha) 40 30 25 Wet and s cea d (a)			
Marie Mari	Part	Part	Part	Part	Marie Mari	Marie Mari	Marie Mari	Marie Mari	ZONE 28 of owe Other Ca chreses: ZONE 28 of owe Other Ca chresen	We had an and the first are and a	w T		
Marie Mari	Market M	Market M	Market M	Market M	Marie Mari	Marie Mari	Marie Mari	Marie Mari		60 O stream two ship conclosusing encoughing	Con		
Marie Mari	Part	Manual Paris Manu	Manual Paris Manu	Part	Marie Mari	Manual Paris Manu	Manual Paris Manu	Manual Paris Manu		Ki knowledge gaps i ed 1 1 1 Knowledge gaps i ed	\$400,000 \$400,000 \$400,000 unit \$400,000 \$400 \$ \$ \$ \$ \$ \$ \$ \$		
Part	Part	Part	Part	Part	Part	Part	Part	Part	ZONE 32 and owe Oh u and Pui Ca chreens		\$ \$200,000 \$240,000 \$150,000 unt \$200,000 \$240,0 150,000 \$		
Marie Mari	Marie Mari	Marie Mari	Marie Mari	Marie Mari	Marie Mari	Marie Mari	Marie Mari	Marie Mari	ZONE 28 od ose Ohau R ve cand m.d - kec ukali Uppe		5200,000 5150,000 5150,000 unt 5200,000 4452,000 000 ver v	2 52 400 000 51 800 000 51 800 000 568 571 551 429 551 429 589 141 566 857 566 857	
Marie Mari	Marie Mari	Marie Mari	Marie Mari	Marie Mari	Marie Mari	Marie Mari	Marie Mari	Marie Mari			na		
Marie Mari	Marie Mari	Marie Mari	Marie Mari	Marie Mari	Marie Mari	Marie Mari	Marie Mari	Marie Mari					
Marke Control Contro	Marke Control Contro	Section Control Cont	Section Control Cont	Marke Control Contro	Marke Control Contro	Marke Control Contro	Marke Control Contro	Marke Control Contro				, , , , , , , , , , , , , , , , , , , ,	
Market	Market	Market	Market	Market	Market	Market	Market	Market		0 % 10 m 4/4/m hi			
Marke Mark	Marke Mark	Marke Mark	Marke Mark	Marke Mark	Marke Mark	Marke Mark	Marke Mark	Marke Mark	20NE 4 accomment also pain	It and epacement 0 3 15 six d placement (no.)			
Section Part Section Part Section	Section Part Section Part Section	Section Part Section Part Section	Section Part Section Part Section	Section Part Section Part Section	Section Part Section Part Section	Section Part Section Part Section	Section Part Section Part Section	Section Part Section Part Section			5231000 \$ 523100 530 285 000 55 775 000 51 848 000 once		
The column of	The color of the	The color of the	The color of the	The color of the	The color of the	The column of	The column of	The column of					
Part	Part	Part	Part	Part	Part	Part	Part	Part	pan pan	riginitat di a edia eas.	571 571 1 ha 578 100 542 600 513 490 annual :	S \$2.738.500 \$1.461.000 \$472.150 \$78.000 \$42.600 \$13.460 \$101.530 \$55.380 \$17.537	
Part	Part	Part	Part	Part	Second Column Col	Part	Part	Part		Son Il maneral set p.p. educo reget: 1200 600 190 tima il maneral eta p.p. e egeti sti cin edu. asi	568 ha 574 800 540 800 512 920 Eve y 15 yea s	3 \$224.400 \$122.400 \$38.760 \$6.411 \$3.497 \$1.107 \$8.235 \$4.546 \$1.440	
Maria Mari	Maria Mari	Maria Mari	Maria Mari	Maria Mari	Maria Mari	Marie Part	Marie Part	Marie Part		Black back id gu i piedo o cont di 2 2 1 Black back digui piedo o cont di 0 si e na i e i shi pa e			
Marie Mari	Marie Mari	Marie Mari	Marie Mari	Marie Mari	Marie Mari	Marie Mari	Marie Mari	Marie Mari	pan	O stream we ship one line using use 20 25 25 using well conditions on the same stream and the same stream	\$12,000 \$12,000 \$12,000 unt \$660,000 \$600,000 \$480,000 ence		
Second	Second Control Seco	Second	Second	Second Control Seco	Second	Marie Mari	Marie Mari	Marie Mari		Recta on o wade spheme at the commence of the	\$500 \$500 \$500 km \$5,000 \$5,000 annual :		
Decided Process Proc	Decided Process Proc	Decided Process Proc	Decided Process Proc	Column C	Decided Process Proc	Decided Process Proc	Decided Process Proc	Decided Process Proc		Si e paci it th extended species 5 5 5 5 5 5 5 5 5 5 5 5 5 5 5 5 5 5 5			
Column C	Column C	Column C	Column C	Column C	Column C	Column C	Column C	Column C		P o et and en ance slog cal 1 1 0 candenta			
Second	Second	Second	Second	The column	Second	Second	Second	Second	20NE 4 atchment also Wet ands in Tekapo atchment also skylon skylon atchment	sal ec exampleca e 'molds di ays 400 200 10 ecq al values exam			
Decision Section Sec	Decision Section Sec	Decision Section Sec	Decision Section Sec	Decision Section Sec	Decision Section Sec	Decision Section Sec	Decision Section Sec	Decision Section Sec	20NE 4 ekapo acchiment also Ca c Godiny MacAu ay it ve c also contact	Ma reterant e su vei la ce and et dui per core di a pe 15 15000 15	and .		
Second Control Contr	Second S	Second S	Second S	Second S	Second Control Contr	Second S	Second S	Second S	along forfax	Rucsel up is a discody weed control and a discode weed control along casal kind control a ong casal	seed \$500 \$500 \$500 km \$22,500 \$22,500 annual o Svea		
										care servaniand care region and adjust	51500 \$1500 \$1500 ha \$54000 \$34500 \$21000 3year	3 \$162'000 \$103.500 \$63.000 \$4.629 \$2.957 \$1.800 \$6.017 \$3.844 \$2.340	
		Discrete and property of the control of the contr	Discrete and property of the control of the contr					Direct Control Contr	ZONE 4 achiment also Y kapo Canal shape forther shape	C eation o neutral convertis de control en de control et au control et action et au control et action et a	100 E 5200.000 \$200.000 \$300.000 unit \$600.000 \$300.000 \$150.000 3 years	3 \$1800,000 \$600,000 \$650,000 \$51,429 \$25,714 \$12,857 \$66,857 \$23,429 \$16,714	
									the state of the s				
Company Comp		2004	2004		Company Comp	Company Comp	Company Comp	Company Comp					
Marie Mari	Marie Mari	Marie Mari	Marie Mari	Marie Mari	Marie Mari	The state of the s	The state of the s	The state of the s		Side of page pagement Side of an outsthreet			
1 23200 13200 13200 13200 13200 100 100 100 100 100 100 100 100 100	32500 52000 52000 = 94400 54000 52000 eve 1 594,000 54000 52000 eve 1 594,000 54000 52000 52740 51509 5914 53146 52377 51509	32500 12200 12200 et 94400 54300 12200 ect 1 58400 14400 12200 1270 1280 894 1544 1277 1189	1 55400 13200 13200 ert 91400 54400 13200 ere 1 55400 14400 13200 13200 1320 1320 1320 1320 1320	1 55000 51000 51000 51000 01000 01000 01000 01000 01000 01000 01000 51000 51	1 5000 1200 1200 1200 1200 1200 1200 120	1 9400 5400 5200 5200 5200 5200 5200 5200 5	1 9400 5400 5200 5200 5200 5200 5200 5200 5	1 9400 5400 5200 5200 5200 5200 5200 5200 5		de st east-Q chinal el cand 2 2 il management (weeds)	\$1,000 \$1,000 \$2,000 ha \$15,000 \$9,000 \$2,000 annual	, ,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,	
				CO CO		316.0	3/6,0	36.0		The second secon	\$12,000 \$32,000 \$22,000 unt \$86,000 \$64,000 \$22,000 ence	1 586.000 564.000 527.000 52.743 51829 5914 53.565 52.377 51189	
		3											
3/80	3/6	3/2											

									Small mammal	Sma I mammal							We land		ste			Application of key	
Key act ons (Waltaki alues)				is and eplacement	@ idpain	@adpain	Weed m intenance -	Weed main en n e-	p eda o ongo ng	p eda o ongo ng	Sm I mammal	Small mammal	ill ck backed gull						at ve	Know edge	Know edge		one ey
	s ands c eat on	Is and c eat on cos s	Is and s epia ement	costs	clea ance	c ea ance costs	cea ed a eas	c ea ed a eas costs	memt at c ea ed	mamt at cea ed	o edato setua costs	a edata setua costs	a edata cont al	Black backed gull a e		We lands dies ed cos s	es a ed	Ve lands +	sh Osiena	gaps i led	gaps I ed co ts	knowledge gags	indin s
			At ul epacement		at 77ha pe km		At slands + b aid p a n								At 1 wet and pe 5 m		At 1		M	At \$30k each		Nom nally at	
Ca cuta ions			ve y 20 yea s (10% pe		4900ha land		n ha at 20% o hab tat		At is ands + b a d		At is ands + b a d				12 pe side 24 in		we land		11300	pe annum o		\$100k each o	
-	At 1 ha each		At \$2000 pe ha		a sa Gikmi		a ea c e ted		o ain in ha At 80% o hab tat		o ain in ha At 80% o h b tat		At colonies At \$20,000 pe		to all At 50ha oe		00 S At \$15	š	e age 11300	2 year o i a di \$90k		ia ds. shand	
Costs	At \$3000 pe ha		ma ntenance build pe		At \$3000 pe ha				a eac eated At		a ea c eated At		calany per year a S				pe plant		pe	Naive sh			
	c est on		10 years		c eat on		At \$50 per treat diha		200m spacing 9		200m spacine 9		ven s Est mated 10		At \$2000 pe ha dea e	1	0.0		nowm.	590k			
Scena io 1 key act ons is ablish and main ain the biald plain at a late.																	24 240			iza da			
o 2 Skm pe annum ove 24 yea s to achieve 100% o available b a d																	24 240 ha			e et al		A1(200%) o key	
p ain P ov de sandsove 12% o and a ea mmed ate y to secu e																							
th eatened pecies. Re ove a likey-we lands and side st eams as pait o																	2600		00%	nue teb a es		ecomm nda ions	
Soma to 2 key act one Satablish and maintain 20 is ands and 5 x Skm	60 ha	\$180 000	6	\$63 000	43km	\$14 333 000	1450.3	\$3 \$37 96A	3439.3	6373.764	36767	C364 846	100% 10	\$1,000,000	100% 34 36554	C736.66	3 414.	\$360,000	34 MARRIED	also .	ccen non	was un	******
se tions o b aid plain 40% o available b aid plain) so that thies ened																	80% 19			iza du			
bild goog ations a eseculed Recover most levi wet ands and lide																	190 ha			e et al		Most (80%) o	
st earns ill knowledge gaps in I za dis and ie lest ill linve leb ates and																	1900			ove teb a es		ecomm nda ions	
at earth 11 knowledge gaps in 12a disand in left i 1 linve leb abes and	- 10	\$90,000		\$31 500	25km	\$5,775,000	2 282	\$1,026,375	1570	\$110 291	1570	\$105 975	80% 8	\$800,000	80% 19 190 ha	\$\$70.00		ener oon oo	S 25 mmmm			aken up	
		390 000		311 100	2101	44774000	200.0	41 020 47 8	100	******	1170	2200 073	AUN A	2800 000	NO. 10 10013	227000		,283 COO AL					
Scena io 3 key act one. Establish and maintain 15 is ands and 4 x 2km.																	50% 12			iza de		Highest p is ity	
se tions o exemp a b aid plan incuding weed and p eda o ont of																	120 ha			e et al		50%) o	
Recover key we lands and side at earns ill knowledge gaps in I za ds																	1200			nue teb a es		ecomm nda ions	
and te st allieve teb at s and n native i h management	15	\$45 000	15	\$15.750	Skm	\$1,949,000	189 2	5231 275	507 8	\$25.705	507.8	\$34 277	2 2002	\$500,000	50% 12 120 ha	90 0962	al n s	\$180,000 50	N 15 memen	sh	000 0822	akenup	*******

Released under Official Information Act

 From:
 Richard Maloney

 To:
 Colin O"Donnell

 Cc:
 Ken Hughey

Subject: FW: Ver_2 Scenarios for levels of value management Tekapo system_SUMMARY.xlsx

Date: Thursday, 5 May 2022 7:29:05 am

Attachments: Ver 2 Scenarios for levels of value management Tekapo system SUMMARY.xlsx

Hi Colin

I'd appreciate you having a quick scan of this doco. The red tab is all costs for all 5 "zones" in the catchment. Zone 5 is Genesis, rest is Meridian.

Ken and I have been working through the actions to include and not, this is in the blue tabs... He is going to use this tomorrow in next discussion ...

Any thoughts, anything stands out as being well out of line (actions or costs)?? Thanks

Richard

From: Richard Maloney

Sent: Wednesday, 4 May 2022 9:18 pm **To:** Ken Hughey < khughey@doc.govt.nz>

Subject: Ver_2 Scenarios for levels of value management Tekapo system_SUMMARY.xlsx Hi Ken

Here's a summary sheet with some cost estimates. The costs follow from our discussion. I will tidy up a word doco or table showing the cost scenario details

The red tab is the one to look at.

Key points:

- 1. First column of tables is direct costs
- 2. Second column of tables is Direct +30%
- 3. I've rounded costs to nearest \$50k
- 4. While the calculations I've used may be a bit rushed, the overall level feels pretty good.
- 5. There is a good balance between zone 5 (genesis) and the sum of the zone 1-4 ie Meridian bear the greater proportion of costs
- 6. The sites where the are directly impacting (Zone 1, 4, 5) have higher costs than zone 2,3 (Ahuriri and Hopkins/Tasman areas).
- 7. The overall amounts look okay to achieve something real.

Your thoughts welcome. I am at a student presentation session at Otago 9-11. Will give you a text summary info around lunchtime or early arvo. Map is due about midday tomorrow fro GIS team.

Cheers

Richa d

Average annual direct costs Scenario 1

Zone	Zone short name	•
ZONE 1	Lower Waitaki, Hakataramea	\$ 3,600,000
ZONE 2	Ahuriri catchment and lower Lakes	\$ 1,050,000
ZONE 3	Hopkins/Dobson, Tasman, Lakes Pukaki and Ohau	\$ 600,000
ZONE 4	Pukaki, Upper and Lower Ohau Rivers and mid-Lakes	\$ 2,450,000
ZONE 5	Tekapo catchment, Lake Tekapo, Godley, Cass, MacAulay	\$ 3,050,000
	TOTAL average annual direct cost	\$ 10,700,000

Average annual direct costs Scenario 2

Zone	Zone short name	
ZONE 1	Lower Waitaki, Hakataramea	\$ 1,650,000
ZONE 2	Ahuriri catchment and lower Lakes	\$ 1,000,000
ZONE 3	Hopkins/Dobson, Tasman, Lakes Pukaki and Ohau	\$ 550,000
ZONE 4	Pukaki, Upper and Lower Ohau Rivers and mid-Lakes	\$ 2,300,000
ZONE 5	Tekapo catchment, Lake Tekapo, Godley, Cass, MacAulay	\$ 1,900,000
	TOTAL average annual direct cost	\$ 7,350,000

Average annual direct costs Scenario 3

Zone Zone short name ZoNE 1 Lower Waitaki, Hakataramea \$ 750,000 ZONE 2 Ahuriri catchment and lower Lakes \$ 650,000 ZONE 3 Hopkins/Dobson, Tasman, Lakes Pukaki and Ohau \$ 500,000 ZONE 4 Pukaki, Upper and Lower Ohau Rivers and mid-Lakes \$ 2,150,000 ZONE 5 Tekapo catchment, Lake Tekapo, Godley, Cass, MacAulay \$ 900,000 TOTAL average annual direct cost \$ 4,900,000 TOTAL average annual direct	Zone Short name ZONE 1 Lower Waitaki, Hakataramea \$ 750,000 ZONE 2 Ahuriri catchment and lower Lakes \$ 550,000 ZONE 3 Hopkins/Dobson, Tasman, Lakes Pukaki and Ohau \$ 500,000 ZONE 4 Pukaki, Upper and Lower Ohau Rivers and mid-Lakes \$ 2,150,000 ZONE 5 Tekapo catchment, Lake Tekapo, Godley, Cass, MacAulay \$ 900,000 ZONE 5 Tekapo catchment, Lake Tekapo, Godley, Cass, MacAulay \$ 200,000	Zone	annual direct costs Scenario 3		Scenario 5	average annual costs (Direct+15%OH+15%contingen
ZONE 1 Lower Waitaki, Hakataramea \$ 750,000 ZONE 2 Ahuriri catchment and lower Lakes \$ 650,000 ZONE 3 Hopkins/Dobson, Tasman, Lakes Pukaki and Ohau \$ 500,000 ZONE 4 Pukaki, Upper and Lower Ohau Rivers and mid-Lakes ZONE 5 Tekapo catchment, Lake Tekapo, Godley, Cass, MacAulay \$ 900,000 ZONE 5 Tekapo catchment, Lake Tekapo, Godley, Cass, MacAulay \$ 700,000	ZONE 1 Lower Waitaki, Hakataramea \$ 750,000 ZONE 2 Ahuriri catchment and lower Lakes \$ 650,000 ZONE 3 Hopkins/Dobson, Tasman, Lakes Pukaki and Ohau \$ 500,000 ZONE 4 Pukaki, Upper and Lower Ohau Rivers and mid-Lakes \$ 2,150,000 ZONE 5 Tekapo catchment, Lake Tekapo, Godley, Cass, MacAulay \$ 900,000 ZONE 5 Tekapo catchment, Lake Tekapo, Godley, Cass, MacAulay \$ 700,000					
ZONE 2 Ahuriri catchment and lower Lakes ZONE 3 Hopkins/Dobson, Tasman, Lakes Pukaki and Ohau \$ 500,000 ZONE 4 Pukaki, Upper and Lower Ohau Rivers and mid-Lakes \$ 2,150,000 ZONE 5 Tekapo catchment, Lake Tekapo, Godley, Cass, MacAulay \$ 900,000	ZONE 2 Ahuriri catchment and lower Lakes \$ 650,000 ZONE 3 Hopkins/Dobson, Tasman, Lakes Pukaki and Ohau \$ 500,000 ZONE 4 Pukaki, Upper and Lower Ohau Rivers and mid-Lakes \$ 2,150,000 ZONE 5 Tekapo catchment, Lake Tekapo, Godley, Cass, MacAulay \$ 900,000 ZONE 5 Tekapo catchment, Lake Tekapo, Godley, Cass, MacAulay \$ 700,000	ZONE 1		\$ 750,000		
ZONE 3 Hopkins/Dobson, Tasman, Lakes Pukaki and Ohau \$ 500,000 ZONE 4 Pukaki, Upper and Lower Ohau Rivers and mid-Lakes \$ 2,150,000 ZONE 5 Tekapo catchment, Lake Tekapo, Godley, Cass, MacAulay \$ 900,000 ZONE 5 Tekapo catchment, Lake Tekapo, Godley, Cass, MacAulay SONE 5 Tekapo catchment, Lake Tekapo, Godley, Cass, MacAulay	ZONE 3 Hopkins/Dobson, Tasman, Lakes Pukaki and Ohau \$ 500,000 ZONE 3 Hopkins/Dobson, Tasman, Lakes Pukaki and Ohau 2 ZONE 4 Pukaki, Upper and Lower Ohau Rivers and mid-Lakes \$ 2,150,000 ZONE 5 Tekapo catchment, Lake Tekapo, Godley, Cass, MacAulay \$ 900,000 ZONE 5 Tekapo catchment, Lake Tekapo, Godley, Cass, MacAulay \$ 900,000					
ZONE 4 Pukaki, Upper and Lower Ohau Rivers and mid-Lakes \$ 2,150,000 ZONE 5 Tekapo catchment, Lake Tekapo, Godley, Cass, MacAulay \$ 900,000 ZONE 5 Tekapo catchment, Lake Tekapo, Godley, Cass, MacAulay \$ 900,000	ZONE 4 Pukaki, Upper and Lower Ohau Rivers and mid-Lakes \$ 2,150,000 ZONE 4 Pukaki, Upper and Lower Ohau Rivers and mid-Lakes ZONE 5 Tekapo catchment, Lake Tekapo, Godley, Cass, MacAulay \$ 900,000 ZONE 5 Tekapo catchment, Lake Tekapo, Godley, Cass, MacAulay					
ZONE 5 Tekapo catchment, Lake Tekapo, Godley, Cass, MacAulay \$ 900,000 ZONE 5 Tekapo catchment, Lake Tekapo, Godley, Ca s, M & Aul	ZONE 5 Tekapo catchment, Lake Tekapo, Godley, Cass, MacAulay \$ 900,000 ZONE 5 Tekapo catchment, Lake Tekapo, Godley, Cass, MacAulay					
TOTAL average annual direct cost \$ 4,900,000 TOTAL average annual direct + indirect cost \$ 10 \$ 1	TOTAL average annual direct cost 3 4,900,000 TOTAL average annual direct + indirect costs 3 4,900,000 TOTAL average annual direct + indirect costs 3 4,900,000 TOTAL average annual direct + indirect costs 3 4,900,000 TOTAL average annual direct + indirect costs 3 4,900,000 TOTAL average annual direct + indirect costs 3 4,900,000 TOTAL average annual direct + indirect costs 3 4,900,000 TOTAL average annual direct + indirect costs 3 4,900,000 TOTAL average annual direct + indirect costs 3 4,900,000 TOTAL average annual direct + indirect costs 3 4,900,000 TOTAL average annual direct + indirect costs 3 4,900,000 TOTAL average annual direct + indirect costs 4,900,000 TOTAL average annual direct + indirect + indirect 4,900,000 TOTAL average annual direct + indirect + i	ZUNE 5			ZUNE 5	
	inge.	ZONE 2 ZONE 3 ZONE 4	Ahuriri catchment and lower Lakes Hopkins/Dobson, Tasman, Lakes Pukaki and Ohau Pukaki, Upper and Lower Ohau Rivers and mid-Lakes Tekapo catchment, Lake Tekapo, Godley, Cass, MacAulay	\$ 650,000 \$ 500,000 \$ 2,150,000 \$ 900,000	ZONE 2 ZONE 3 ZONE 4	Ahuriri catchment and lower Lakes Hopkins/Dobson, Tasman, Lakes Pukaki and Ohau Pukaki, Upper and Lower Ohau Rivers and mid-Lakes Tekapo catchment, Lake Tekapo, Godley, Ca S, M CAL

Scenario 1 average annual costs (Direct+15%OH+15%contingency)

Zone	Zone short name	Tot	al
ZONE 1	Lower Waitaki, Hakataramea	\$	4,700,000
ZONE 2	Ahuriri catchment and lower Lakes	\$	1,400,000
ZONE 3	Hopkins/Dobson, Tasman, Lakes Pukaki and Ohau	\$	750,000
ZONE 4	Pukaki, Upper and Lower Ohau Rivers and mid-Lakes	\$	3,200,000
ZONE 5	Tekapo catchment, Lake Tekapo, Godley, Cass, MacAulay	\$	4,000,000
	TOTAL average annual direct + indirect cost	Ś	13.900.000

Scenario 2 average annual costs (Direct+15%OH+15%contingency)

occinario E ar	arage armaar toots (Directi 1570011-127000111118c11077	
Zone	Zone short name	
ZONE 1	Lower Waitaki, Hakataramea	\$ 2,150,000
ZONE 2	Ahuriri catchment and lower Lakes	\$ 1,300,000
ZONE 3	Hopkins/Dobson, Tasman, Lakes Pukaki and Ohau	\$ 750,00
ZONE 4	Pukaki, Upper and Lower Ohau Rivers and mid-Lakes	\$ 3,000,000
ZONE 5	Tekapo catchment, Lake Tekapo, Godley, Cass, MacAulay	\$ 2,450,00
	TOTAL average annual direct + indirect cost	\$ 9,550,000

Scenario 3 av	erage annual costs (Direct+15%OH+15%contingency)		
Zone	Zone short name		
ZONE 1	Lower Waitaki, Hakataramea	\$	950,000
ZONE 2	Ahuriri catchment and lower Lakes	\$	850,000
ZONE 3	Hopkins/Dobson, Tasman, Lakes Pukaki and Ohau	\$	650,000
ZONE 4	Pukaki, Upper and Lower Ohau Rivers and mid-Lakes	\$	2,800,000
ZONE 5	Tekapo catchment, Lake Tekapo, Godley, Cars, M. cAula	\$	1,200,000
	TOTAL average annual direct + indirect cost	Ś	6.350.000

Sum of Aver	age annual cost S1	
Zone	Zone short name	Total
ZONE 1	Lower Waitaki, Hakataramea	3,587,814
ZONE 2	Ahuriri catchment and lower Lakes	1,041,314
ZONE 3	Hopkins/Dobson, Tasman, Lakes Pukaki and Ohau	574,357
ZONE 4	Pukaki Upper and Lower Ohau Rivers and mid-Lakes	2,430,586
ZONE 5	Tekapo catchment, Lake Tekapo, Godley, Cass, MacAulay	3,043,097
Grand Total		10,677,169

Sum of Aver	age annual cost S2	
Zone	Zone short name	Total
ZONE 1	Lower Waitaki, Hakataramea	1,646,326
ZONE 2	Ahuriri catchment and lower Lakes	992,629
ZONE 3	Hopkins/Dobson, Tasman, Lakes Pukaki and Ohau	546,214
ZONE 4	Pukaki Upper and Lower Ohau Rivers and mid-Lakes	2,290,243
ZONE 5	Tekapo catchment, Lake Tekapo, Godley, Cass, MacAulay	1,865,183
Grand Total		7.340.594

Sum of Avera	age annual cost S3	
Zone	Zone short name	Total
ZONE 1	Lower Waitaki, Hakataramea	716,280
ZONE 2	Ahuriri catchment and lower Lakes	633,471
ZONE 3	Hopkins/Dobson, Tasman, Lakes Pukaki and Ohau	481,571
ZONE 4	Pukaki Upper and Lower Ohau Rivers and mid-Lakes	2,146,114
ZONE 5	Tekapo catchment, Lake Tekapo, Godley, Cass, MacAulay	898,583
Grand Total		4,876,020

Sum of S1 annual (Direct+15% OH+15%contingency)		
Zone	Zone short name	Total
ZONE 1	Lower Waitaki, Hakataramea	4,664,159
ZONE 2	Ahuriri catchment and lower Lakes	1,353,709
ZONE 3	Hopkins/Dobson, Tasman, Lakes Pukaki and Ohau	746,664
ZONE 4	Pukaki Upper and Lower Ohau Rivers and mid-Lakes	3,159,761
ZONE 5	Tekapo catchment, Lake Tekapo, Godley, Cass, MacAulay	3,956,026
Grand Total		13.880.319

Zone	Zone short name	Total
ZONE 1	Lower Waitaki, Hakataramea	2,140,223
ZONE 2	Ahuriri catchment and lower Lakes	1,290,417
ZONE 3	Hopkins/Dobson, Tasman, Lakes Pukaki and Ohau	710,0 9
ZONE 4	Pukaki Upper and Lower Ohau Rivers and mid-Lakes	2,977,31
ZONE 5	Tekapo catchment, Lake Tekapo, Godley, Cass, MacAulay	2,424,738
Grand Total		9.542.773

	Grand Total	7,340,594	Grand Total	renapo catalinent, take renapo, dodicy, cass, maeri	9,542,773
	Scenario 3				
	Sum of Average annual cost S3		Sum of S3 annual (Direct+15% OH+15%contingency)		
	Zone Zone short name	Total	Zone	Zone short name	Total
	ZONE 1 Lower Waitaki, Hakataramea ZONE 2 Ahuriri catchment and lower Lakes	716,280 633,471	ZONE 1 ZONE 2	Lower Waitaki, Hakataramea Ahuriri catchment and lower Lakes	931,164 823,513
	ZONE 3 Hopkins/Dobson, Tasman, Lakes Pukaki and Ohau	481,571	ZONE 3	Hopkins/Dobson, Tasman, Lakes Pukaki and O u	626,043
	ZONE 4 Pukaki Upper and Lower Ohau Rivers and mid-Lakes ZONE 5 Tekapo catchment, Lake Tekapo, Godley, Cass, MacAulay	2,146,114 898,583	ZONE 4 ZONE 5	Pukaki Upper and Lower Ohau Rivers and mid-Lak Tekapo catchment, Lake Tekapo, G dley Ca MacAi	
	Grand Total	4,876,020	Grand Total	rekapo catchinent, take rekapo, o diey ca Wiacki	6,338,826
1					
				X	
				•	
			* (\(\sigma^*\)		
			*		
			\(\text{C}\)		
		•			
		X			
		-			
		•			
	_				
•					
V					
	916.0				
•					
1					

The column	The column	Thi	The column	Thi	March Marc	The column	Zone one that A 5 i y A so ZONE I one Wal all ZONE I skill to area ZONE I			Zives cost scer Zives cost sce 15 ves ont sc. Are see sen Are see sn Are see a St sensal Dt e S2 annual Dt ect-12% OH-12%	
Mathematical Property of the	Part	Part	Part	Part	March Marc	March Marc	HIR D SING		\$1,000 \$1,000 \$2,000 hs \$180,000 \$80,000 \$45,000 ence 1	\$180,000 \$80,000 \$45,000 \$51,61 \$1,571 \$1,286 \$6,686 \$1,361 \$1,671 \$1,671 \$1,676,000 \$1,270,000 \$1,280,000 \$11,600 \$10,000 \$54,000 \$1,0	\$272 700 900 \$256 920 800 \$170 660 710 35 was o als \$50 677 169 \$7 240 564 \$6 876 020 ave are arroual cital
Part			B aid pix i lea ance letti								
Part				\$89.250.000 \$35.700.000 \$11.900.000 \$2.550.000 \$1.000.000 \$340.000 \$3.315.000 \$1.325.000 \$442.000							
Part		Sm. Il maneral ongo ng p edito 1500 600 200 egentat di a ed a eas.	s eac \$71 \$71 \$71 ha \$206,500 \$42,600 \$14,200 annual 35								
Part	Part	Part	Part	Part	March	March		at time add east 200 cont of 100 cont of 1	it ack backed gull p edato	, , , , , , , ,	
The column	Part	Part		(10)	,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,						
Part			21000 21000 21000 W 220000 220000 280000 2801								
March Marc	March Marc	March Marc	March Marc	March Marc	March Marc	March Marc			51 500 \$1		
The column		Exceeledge gaps: i ed 1 1 1									
Mathematical Control	Mathematical Control of the contro	Mathematical Control of the contro	ZONE 1 Owe Wai all Owe Wai all cat hinert and Hall to arms Halls a arms	Application or ey and rigic cars 51 51 51 51	Application to their indines						
Professor Prof	Professor Prof	Professor Prof	Professor Prof	Professor Prof	Professor Prof	Professor Prof			\$200.000 \$150.000 \$150.000 unt \$200.000 \$150.000 \$150.000 eve y 1 yea s 12	52 400 000 51 800 000 51 800 000 568 571 551 429 551 429 589 143 566 857 566 857	
Mathematical Property of the	Mathematical Property of the	Mathematical Property of the	Mathematical Property of the	Mathematical Property of the	Mathematical Property of the	Mathematical Property of the			2100 2100 2100 is 36500 26500 2100 666 1	\$45,000 \$36,000 \$21,000 \$1,286 \$1,029 \$600 \$1,671 \$1,327 \$780	
Mathematical Property of the	Mathematical Property of the	Mathematical Property of the	Mathematical Property of the	Mathematical Property of the	Mathematical Property of the	Mathematical Property of the	Morti		2000 3000 3000 011 3100 3100 3170 0071911 12		
March Marc	March Marc	March Marc	March Marc	March Marc	Part	Part	Morti		\$231.000 \$231.000 \$231.000 km \$663.000 \$663.000 once 1 Weed main examce - clos ad		
								5m: Emaneral ongo ng p eduto 2000 2000 800	p edato ingrittat clea ed	\$1570.000 \$1570.000 \$1570.000 \$227000 \$102.000 \$102.000 \$112.000 \$122.000 \$122.000	
							ZONE 2 Abuli achiest and owe Abuli	Inginiary residen		\$7.455.000 \$7.455.000 \$1.988.000 \$213.000 \$256.000 \$276.900 \$276.900 \$73.840	
							ZONE 2 acchanged and Abulifice		Black backed out is edited	\$1350,000 \$1350,000 \$1350,000 \$28571 \$38571 \$38571 \$50.143 \$50.143 \$50.143	
							One star			\$600.000 \$480.000 \$300.000 \$17.143 \$13.714 \$8.571 \$22.286 \$17.629 \$11.143	
							des since	two tands as a ed pla ting encing 100 80 50	THE EAST (400 M p JACE N)	\$750,000 \$600,000 \$275,000 \$21429 \$17143 \$10714 \$27857 \$22.286 \$13,929	
							Abo i i			\$120,000 \$156,000 \$160,000 \$9.143 \$7.314 \$4571 \$11,886 \$9.509 \$5.943	+ () -
							Own plant			\$2,900,000 \$2,900,000 \$2,900,000 \$82,857 \$82,857 \$82,857 \$937,714 \$937,174 \$107,174	
								knowledge gaps		\$3,000,000 \$2,400,000 \$1,500,000 \$85,714 \$68,571 \$42,857 \$111,429 \$89,543 \$55,714	X
							abuli	Side of earnica chrisest management 1 1 0	\$200,000 \$150,000 \$150,000 ant \$200,000 \$150,000 eve v2 was s 12	\$2,400,000 \$1,800,000 \$1,800,000 \$68,571 \$51,429 \$51,429 \$89,143 \$66,857 \$66,857	
							Muli	Sm Il manusul orgong piedato 3000 3000 800	taria interiora con ing	3105 UND \$105 000 \$0 \$1000 \$1000 \$0 \$13000 \$0	7
								Sm Il manual set pp ediso mgmt 3000 3000 800 at clea ed a eas	2 665 571 571 571 km \$213 000 \$113 000 s64 000 annual 35 final mammal stage edge 2	275 900 571 840 p. marcon p.11 1000 p.11 1000 p. marcon 5276 900 577 840	
								tis ge ed weed maintenanile (i m.o. so	Ta geted we of main enance kinn a third Taw) 5500 5500 5500 km 55.000 54.000 52.500 annual 25	\$175,000 \$140,000 \$07,500 \$5,000 \$4,000 \$2,500 \$6,500 \$5,200 \$1,25	
								manag ment(pecie) 5 5 5	\$ to speci c it as ened species 50,000 \$20,000 \$30,000 unit \$350,000 \$350,000 annual 25	\$5,250,000 \$5,250,000 \$5,250,000 \$150,000 \$150,000 \$295,000 \$295,000 \$95,00	
					Mathematical Control of the contro	Mathematical Control of the contro		(nec) 20 20 0	at cea ed a eas \$2,700 \$2,700 \$2,700 km \$54,000 \$54,000 \$0 annual 35		
Mathematical Control of Math	Mathematical Control of Math	Mathematical Control of Math	Mathematical Control of Math	Mathematical Control of Math	Part	Part	skok and	two tands as a ed pla ting encing 50 30 25	THE EAST (400 M P ANT N) AND A STEEL (400 M P ANT N) ANT N) AND A STEEL (400 M P ANT N) AND A STEEL (400 M P ANT N) ANT N) AND A STEEL (400 M		
Mathematical Control of the contro	Mathematical Control of the contro	Mathematical Control of the contro	Mathematical Control of the contro	Mathematical Control of the contro	Mathematical Control of the contro	Mathematical Control of the contro	sinks and				
Mathematical Control of the contro	Mathematical Control of the contro	Mathematical Control of the contro	Mathematical Control of the contro	Mathematical Control of the contro	Mathematical Control of the contro	Mathematical Control of the contro	Hop int Dob of		tott of no.) \$150,000 \$150,000 \$150,000 unit \$200,000 \$20		
Mathematical Control of the contro	Mathematical Control of the contro	Mathematical Control of the contro	Mathematical Control of the contro	Mathematical Control of the contro	Mathematical Control of the contro	Mathematical Control of the contro	Mark and	Weed management on lake edge 5 3 1	Weed management on also		
Part	Part	Part	Part	Part							
					Part	Part					
Mathematical Control of the contro	Mathematical Control of the contro	Mathematical Control of the contro	Mathematical Control of the contro	Mathematical Control of the contro	Part	Part	tion by Bob or				
Mathematical Control of the contro	Mathematical Control of the contro	Mathematical Control of the contro	Mathematical Control of the contro	Mathematical Control of the contro	Mathematical Control of the contro	Mathematical Control of the contro					
Mathematical Control of the contro	Mathematical Control of the contro	Marie	Marie	Marie	Mathematical Control of the contro	Mathematical Control of the contro			dia 4 placement(no) \$10,500 \$10,500 \$10,500 wet \$50,500 \$20,500 \$20,500 wet y3 years \$2		
Mathematical Control	Mathematical Control	Mathematical Control	Mathematical Control	Mathematical Control	Part	Part	- Andrews			54 158 000 65 000 52 310 000 510 000 566 000 5154 440 5128 700 585 800	
The column	Part	Part									
Mathematical Control of Control	Mathematical Control of Control	Mathematical Control of Control	Mathematical Control of Control	Mathematical Control of Control	Mathematical Control of Control	Mathematical Control of Control		registatica a edia essi	9 405 571 571 km 5213 000 5342 000 571 000 annual 35		
Mathematical Control of the contro	Part	Part	Part	Part	Part	Part	Francisco Co.			* // 12	
Marke Mark	Marke Mark	Marke Mark	Marke Mark	Marke Mark	Marke Mark	Marke Mark		(inc) (ii) We lands c sa ed [ha] 50 20 25			
Marke Mark	Mark	Mark Mark of Mark	Mark	Mark Mark of Mark	Mark	Mark	20NE 4 and one Other Ca chimero.	(iii) We lands as o ad pils ting encing 50 30 25	Warr sade auto and in service		
Property of the content of the con	Property of the content of the con	Property of the content of the con	Property of the content of the con	Property of the content of the con	Marie Mari	Marie Mari	20NE 4 and owe Ohau Ca chimeets	O it to not we thip otec ion using unit conditions of the condition of the	O si a no i a chipa eccori us ng wei s and pectich		
Part	Part	Part	Part	Part	Part	Part			Knowledge-gaps led SSB0:000 SSB0:000 SSB0:000 unit SSB0:000 SSB0:0		
Part	Part	Part	Part	Part	Part	Part		Expension Sales	Application by range \$300,000 \$240,000 \$250,000 unit \$300,000 \$240,000 \$250,000 unit \$300,000 \$240,000 \$250,0	53 000 000 52 400 000 51 500 000 585 754 568 571 542 857 5111 429 589 543 555 714	
Martine Mart	Martine Mart	Martine Mart	Martine Mart	Martine Mart	Martine Mart	Martine Mart	ZONE 4 nd owe Ohau R we cand mid-likes ukasi Uppe more and owe AP 4 has		\$200.000 \$150.000 \$150.000 unt \$200.000 \$460.000* 0,000 eve v 12	52400000 51800000 51800000 588571 551429 551429 589343 566857 566857	
Market M	Market M	Market M	Market M	Market M	Market M	Market M	Tables		To pertral we definite resource		
Marie Mari	Marie Mari	Marie Mari	Marie Mari	Marie Mari	Marie Mari	Marie Mari					
Market M	Market M	Market M	Market M	Market M	Market of Mark	Market of Mark	- Internet				
Marke Mark	Marke Mark	Marke Mark	Marke Mark	Marke Mark	Marie Mari	Marie Mari	ZONES school also you and adjacent baid	11 and 2 va ion 0 25 10			
Marke Mark	Marke Mark	Marke Mark	Marke Mark	Marke Mark	Marke Mark	Marke Mark		ts and epacement 0 3 15			
Market M	Market M	Market M	Market M	Market M	Maria Mari	Maria Mari			B aid plu i lea ance km 5221000 \$ 522100 511088000 55775000 51868000 once 1		
					Mark	Mark		Weed maintenance - c ea ed a eas. 1100 600 190	Wied main exactor - clas ed a set. No. 51,700 51,000 ha 51,000,000 51,000,000 522,000 annual 25	\$65,450,000 \$35,700,000 \$11,305,000 \$1,870,000 \$1,000,000 \$223,000 \$2,431,000 \$1,235,000 \$419,900	
Second Column Col	Second Column Col	Second Column Col	Second Column Col	Second Column Col	Second Column Col	Second Column Col	pan	registration is educed.	1 mic 571 571 1 ha 578 200 542 600 513 490 annual 35		
Second Column Col	Second Column Col	Second Column Col	Second Column Col	Second Column Col	Part	Part		31000 003 001			
Marie Mari	Marie Mari	Marie Mari	Marie Mari	Marie Mari	Market M	Market M	day.	Black back digulip edu o cont di 2 2 1	O sienale stipoec		
Second column Second colum	Second column Second colum	Second column Second colum	Second column Second colum	Second column Second colum	Marie Mari	Marie Mari	pan	O is the state we is the protection using well to see that we is the protection using well to see the state of the see that we is the state of the see that we is the	\$22,000 \$22,000 unt \$992,000 \$800,000 ence 1		
Martin M	Martin M	Martin M	Martin M	Martin M	Part	Part		Recto at on o wade legiterine all habil at in South Sact and Causeway 500 500 500	\$500 \$500 \$500 km \$5000 \$5000 annual 25		
Market M	Market M	Market M	Market M	Market M	Mark	Mark	ZONES standard size as a size Ye ago maig no	Sile pecific th extend species S S S	\$ 50 type as seed \$1,000 \$20,0		
Decided Process Proc	Decided Process Proc	Decided Process Proc	Decided Process Proc	Decided Process Proc	Decided Process Proc	Decided Process Proc		Polect and en lance e slog cal 1 1 1	2 24d 4902 5000 000 \$400.000 \$250.000 unt \$500.000 \$400.000 \$250.000 2 years 2		
Part	Part	Part	Part	Part	Mark	Mark		sal ec examples a e moids 6 ays 400 200 10	ecu also ser examples:		
					Decision of the process of the pro	Decision of the process of the pro	48300 500844	FAST A DEL DOUGLE AND REAL PARTY.	20 210 210 310 310 310 310 310 310 310 310 310 3		
Market M	Market M	Market M	Market M	Market M	- Market	- Market	skom forfar	Russel up it a d woody weed cost of along cancel limit	Hast of upin and woody weed cost of a ong canal 5500 5500 \$500 km \$22.500 \$22.500 annual o 5.vea \$	\$112500 \$112500 \$12500 \$3214 \$3214 \$3214 \$4179 \$4179	
Control Cont	Control Cont	Control Cont	Control Cont	Control Cont	Company Comp	Company Comp	skom forfar	C ea ion o next all on with do	edge \$1500 \$1500 \$1500 hs \$54,000 \$24,000 \$21,000 \$2900 \$ 2 Centure next all low		
Column C	Column C	Column C	Column C	Column C	Column C	Column C	skom forfar	Connec ed o care s land	wet ands connect of colone is \$200,000 \$200,000 \$200,000 unit \$600,000 \$200		
2005 2006 2007	2005 2006 2007	2005 2006 2007	2005 2006 2007	2005 2006 2007	Company Comp	Company Comp					
Date and Representation of the Control of the Contr	Date and Representation of the Control of the Contr	Date and Representation of the Control of the Contr	Date and Representation of the Control of the Contr	Date and Representation of the Control of the Contr	The state of the s	The state of the s		Side of an programment	idest amounthment		
							ZONES atchment also Y kapoc schroea	Side of earn calches elicand a 2 1	0 si ena i e si po estan ui ng wei candpest sh		
				100	SIS OF THE PROPERTY OF THE PRO	36.0					
			7. ``								
3/8	3/6	3	3 `								
3/8		3									
	3/6	3									
		3									

	1								Small mammal	Sma I mammal							We land	0				App ica ion o key	
Key act ons				is and eplacement	@ idpain	@adpain	Weed m intenance -	Weed main en n e-	p eda o ongo ng	p eda o ongong	Sm I mammal	Small mammal	ill ck backed gull					nat	ve	Know edge	Know edge	ind ngs om	one ey
	s ands c eat on	is and c eat on cos s	Is ands epia ement	costs	clea ance at 77ha pe km	c ea ance costs	cea ed a eas	c ea ed a eas costs	memt at c ea ed	mamt at cea ed	o edato setua costs	a edata setua costs	a edata cont al	Black backed auli o e	Wet ands clea ed	We lands dies ed cos s	esoled W	le lands 4	h Osiera	asps i led	gaps I ed co ts	knowledge gags	indin s
Carcula ions			At uil op acement ye v 30 yea s (10% ge		4900ta land		At slands + b aid p a n n ha at 20% o hab tat		At is ands +b aid		At is ands + b a d				At 1 wet and pe 5 ms 12 ge side 24 in		At 1 we land	81		At \$30k each on annum o		Nom nal y at \$100k each o	
Catola lois	At 1 ha each		and an less of travelles		a sa Gkmi		a ea c e ted		gain in ha		g ain in ha		At colonies		to all At 10ha pe					3 years o		i a ds shand	
	ALL IN TAKE		At \$3000 pe ha		2 10 10 11		3 83 5 9 183		At 80% o hab tat		At 80% o h b tat		At \$30,000 pe		TO ST. ALL SUITS OF		De S At \$15	200 531	800	i a ds 590k		1300 01300	
Costs	At \$3000 pe ha		ma ntenance build pe		At \$3000 pe ha				a eac ested At		a ea c eated At		calany pe yes a S				pe plant	P		Naive sh			
	c est on		10 vea s		c eat on		At \$50 per treat diha		200m spac ne 9		200m spacine 9		vea s Est mated 10		At \$2000 pe ha dea ed		D0	ne	um.	\$90k			
Scena io 1 key act ons. So ablish and main ain the biald plain at a late.																	24 240			iza du			
o 2 Skm pe annum ove 24 yea s to achieve 100% o available b a d																	ta and			e et al		ATT10000 o key	
p ain P ov de s ands ove 12% o and a ea mmed ate y to secule th eatened opcies. For over a likey we lands and side stleams as oa tio																	2600	100		ove teb a es		ecomm nda ione	
	60 ha	\$180,000		\$69.000	63km	\$14 222 000	1450.2	52 527 950	2879.7	\$322.256	2079.7	5361 846	100% 10	\$1,500,000	100% 24 360 ha	\$220.00		360 000 3		100 100 2 01	5590,000	Webut Inda total	
Scena io 2 key act one: Setab ish and maintain 20 is ands and 5 x 5km	1	,		,																			
se tions o ib aid plain 40% o available b aid plain) so that thies ened																	80% 19			iza ds			
bi dipopulations a elseculed Recover most ley wet ands and lide																	190 ha			e et al		Most (RON) a	
st eams illknowledge gaps in I za ds and ie lest illinve leb ates and		590 000		\$31,500	25km	\$5,775,000	586.5	\$1,026,375	1570	\$110 391	1570	\$105 975	80% 8	\$1,200,000	80% 19 190 ha	\$570.00	1900	195 nnn 9nv	25 ************************************	nue teb a es	\$580,000	ecomm nda ione aken up	
		\$90 000		541 500	2540	55 775 000	586.5	51026-275	15.70	5110 291	15.70	5205 W/S	NUM N	\$1,000,000	MUN. 19 190 NA	557000		782 000 NOV	25 8000000	un.			********
Scena io 3 key act one. Setab ish and maintain 15 is ands and 4 x 2km																	50% 12			iza ds		Highest p is ity	
se tions o exemp a ib aid plain including weed and pieds o lont of Recover key we lands and side at earns ill knowledge gaps in I za ds																	120 ha			e et al		50%) o	
and te st allinus teb at s and n native i h management																	1200			nue teb a es		ecomm nda ione	
and terror or an army and a first very transagement	15	\$45 000	15	\$15.750	9km	\$1,848,000	189 3	5331 275	507.8	\$25.705	507.8	\$34 277	2 2002	\$750,000	50% 12 120 ha	5360 00	alns :	180 000 SON	15 memens	sh	000 0822	aken up	******

Released under Official Information Act

From: Richard Maloney
To: Ken Hughey

Subject: Ver_2 Scenarios for levels of value management Tekapo system_SUMMARY.xlsx

Date: Wednesday, 4 May 2022 9:18:32 pm

Attachments: Ver 2 Scenarios for levels of value management Tekapo system SUMMARY.xlsx

Hi Ken

Here's a summary sheet with some cost estimates. The costs follow from our discussion. I will tidy up a word doco or table showing the cost scenario details.

The red tab is the one to look at.

eleased index

Key points:

- 1. First column of tables is direct costs
- 2. Second column of tables is Direct +30%.
- 3. I've rounded costs to nearest \$50k
- 4. While the calculations I've used may be a bit rushed, the overall level feels p ett good.
- 5. There is a good balance between zone 5 (genesis) and the sum of the zone 1-4 ie Meridian bear the greater proportion of costs
- 6. The sites where they are directly impacting (Zone 1, 4, 5) have higher costs than zone 2,3 (Ahuriri and Hopkins/Tasman areas).
- 7. The overall amounts look okay to achieve something real.

Your thoughts welcome. I am at a student presentation session at Otago 9-11. Will give you a text summary info around lunchtime or early arvo. Map is due about midday tomorrow fro GIS team.

Cheers

Richard

 From:
 Jo Macpherson

 To:
 Henry Weston

 Cc:
 Ken Hughey

Subject: FW: Initial DOC picture of a biodiversity rich Waitaki - DOC-6954880_Generators Version 4 (002) (002)

Date: Friday, 22 April 2022 9:56:16 am

Attachments: Initial DOC picture of a biodiversity rich Waitaki - DOC-6954880 Generators Version 4 (002) (002).docx

Henry

As discussed, here is the high level document we referred to. Note the wording of the addition to the 'Working in Partnership' section has come from Meridian.

Ken, I will need to try and tidy this up and send back to the Generators today really.

Thanks Jo

From: Ken Hughey <khughey@doc.govt.nz>

Sent: 21 April 2022 12:48

To: Jo Macpherson < jmacpherson@doc.govt.nz>

Subject: Initial DOC picture of a biodiversity rich Waitaki - DOC-6954880_Generators Version 4

(002)(002)

Jo

I've added a little to the Middle section of the Waitaki about catch and carry. Nothing else needed there.

I am happy with the wording of 1 to 6 as the flood flows bit is covered in 1.

OK?

Any progress with Henry

eleasedunder

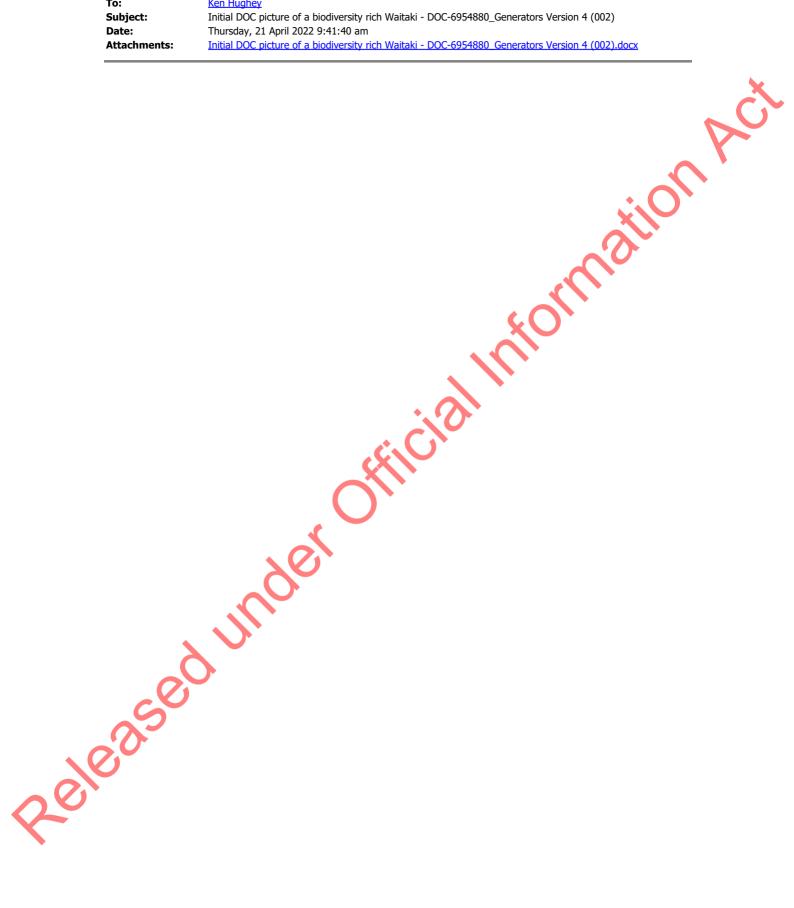
Thanks Ken

From: Jo Macpherson Ken Hughey To:

Subject: Initial DOC picture of a biodiversity rich Waitaki - DOC-6954880_Generators Version 4 (002)

Date: Thursday, 21 April 2022 9:41:40 am

Initial DOC picture of a biodiversity rich Waitaki - DOC-6954880 Generators Version 4 (002).docx **Attachments:**



Reconsenting Waitaki Power Scheme pre-consultation Initial DOC picture of a biodiversity rich Waitaki

22 March 2022

INTENT:

The parties (the Department of Conservation, Meridian Energy and Genesis Energy) will work towards an agreement over the next two months that will achieve ecologically [and culturally] enduring biodiversity conservation outcomes. This is in response to the ongoing ecological effects of the operation of the Waitaki Power Scheme and Tekapo Power Scheme that will exceed any likely outcome from the resource consenting process (including the Environment Court).

The parties:

- acknowledge the national importance of the renewable electricity generation from the Waitaki and Tekapo Schemes, including their critical role in decarbonising the New Zealand economy in response to climate change.
- acknowledge that the construction and ongoing operation of the first hydro-electric dam (operating from 1934) and subsequent developments have led to significant alteration to ecosystem processes and to overall environmental change¹, including for indigenous biodiversity.
- note the importance for nature conservation of the continuity of natural processes, within the limits
 associated with the production of renewable energy from freshwater in the Waitaki catchment. This
 understanding sits within the context of the National Policy Statement for Renewable Electricity Generation,
 National Policy Statement for Freshwater Management, regional water allocation which sits within the
 framework of the Waitaki Catchment Water Allocation Regional Plan, and regional water quality management
 which sits in the Canterbury Land and Water Regional Plan
- acknowledge that a lot has been learned over the last three decades, through Project River Recovery (PRR)
 and other means. These lessons will enable us to work at larger scales and greater pace into the future, with
 confidence around expected conservation benefits. By using an adaptive learning and management approach
 over time, we will further improve these opportunities.
- acknowledge Ki uta Ki Tai & Te Mana o Te Wai
- acknowledge that achieving the biodiversity conservation outcomes requires work at a catchment scale
 working in partnership with Ngāi Tahu, and having regard in other work with to landowners, communities,
 and stakeholders within the catchment; for some of this work there will be a need to be strongly collaborative
 and to take a coordinated approach.
- Acknowledge Te Mana o Te Taio and its implementation plan, which contains government obligations consistent with the intent of this agreement. (footnote Ken)
 https://www.doc.govt.nz/globalassets/documents/conservation/biodiversity/anzbs-implementation-plan-2022.pdf

PRINCIPLES:

The *Terms of Reference in relation to re-consenting with Waitaki power scheme* (TOR) was signed in October 2021 between Meridian and DoC and set out a list of agreed principles (refer to Appendix 1). These were discussed on 15th March 2022 and largely accepted, with some minor additions. The revised set of principles are listed below:

Good faith

Agreements are to be reached in good faith, supported by open, honest and respectful dialogue.

Outcome

Agreement and activity should prioritise real biodiversity conservation outcomes in response to the operation of the Waitaki Power Scheme and Tekapo Power Scheme.

Enduring

Agreements must be sufficiently robust to endure in the long term but sufficiently agile to move forward.

DOC: 6954880

¹ This change has included detrimental impact to some key values but gains for some other values.

Fairness

Agreements should be perceived to be even-handed and fair.

Integration

Agreements are to be reached with an understanding of the inter-relationships between the parties and with other processes and parties.

Treaty Partner

The parties acknowledge the roles that DOC as part of the Crown and Ngāi Tahu have as Treaty Partners under Section 4 of the Conservation Act.

Realism

Agreements will focus on ecological [and cultural] practical results on the ground while recognising NZ's climate change commitments and the need for renewable energy.

Scope

Agreements will focus on existing hydro activities and replacement consents rather than expansion

OUTCOME STATEMENT:

The parties discussed² and built on the three aims of DOC's Ngā Awa programme and agreed on the following outcome statement:

The parties will work together towards improving the condition, biodiversity, ecological processes and other values of the braided rivers and associated environment including the wetlands within the Waitaki catchment.

This outcome will be achieved via specific objectives through collaboration and co-design with our project partners. Biodiversity conservation planning, including prioritisation, will be underpinned by sound technical and scientific advice. The importance of taonga species will be recognised, along with the relationship between conservation and other land uses and the intersection between the two.

THE DEPARTMENT'S APPROACH:

We will describe an aspirational but achievable picture of what the Waitaki Catchment, where linked to braided rivers and their environs, could look like in the long te m. This picture is broken down into two sub-contexts: the upper and lower catchments. The upper catchment has two parts reflecting the influence of the two power schemes: an 'impacted' braided river and environs perspective, and a 'non-impacted' braided river and environs natural state perspective.

We will then specifically define the value set we are seeking to improve, focusing on ecological [and cultural] values, including the protection, enhancement and restoration of ecological function, habitat protection, and management and potential use of sensitive species populations. We will enter into detailed negotiations around staging and the range of work needed to achieve outcomes across the following:

- Lake margins and deltas
- Wetland areas and springs associated with lakes and braided rivers
- Braided rivers both aquatic, within the braid plain) and their margins
- Areas of connection between these elements

OPPORTUNITIES AND LIMITATIONS:

There a evalues we will seek to provide for that are known to contribute to an overall positive, ecological [and cultural] enduring conservation gain. For example, thriving populations of taonga and/or iconic species, or management of the eatened or at-risk species to ensure no further loss induced by the schemes (until they can thrive within their ecosystems).

We also recognise that there are areas where the impacts of the schemes, or the effectiveness of management actions are still not fully understood. For example, impacts on invertebrates or how to cost effectively manage fish passage for multiple species past the main hydro lakes. We recognise there will be opportunities to jointly address these knowledge gaps, and to adapt our management approach to incorporate new understanding.

DOC: 6954880

² At negotiation meeting No 2 held on 15 March 2022.

And we acknowledge there are things we cannot restore, e.g., the natural movement of water through the Catchment where that water is required for hydro-electricity generation.

Finally, we recognise that there are drivers of negative biodiversity outcomes that are both influenced by and are wider than the ongoing effects resulting from the operation of the scheme. Systematically untangling these different drivers is fraught. Our approach is pragmatic, being to focus on the biodiversity [and cultural] values influenced by the scheme, taking an adaptive ecological and evidence-based approach to the management of those values.

WORKING IN PARTNERSHIP

Across the catchment we will work in partnership with manawhenua with the intent of delivering significant and enduring biodiversity, conservation and cultural outcomes in response to the operation of the Waitaki Power Scheme and Tekapo Power Scheme. We will explore opportunities for co-governance and related arrangements.

Working in partnership means committing to governance arrangements for this biodiversity programme that is acceptable to Arowhenua, Waihao and Moeraki Rūnaka. These arrangements will need to be determined with Rūnaka. It is likely to result in a form of governance with decision-making over the strategic direction and delivery of the programme that sits outside of the normal Departmental structures.

WORKING WITH OTHERS

Across the catchment we will have regard to others in the delivery of ecological [and cultural] enduring biodiversity conservation outcomes in response to the operation of the Waitaki Power Scheme and Tekapo Power Scheme and multiply the benefits gained from each other's activities across the eatchment. This includes collaborating and coordinating where appropriate with:

Landowners and local communities

eleasedunc

- Canterbury Aoraki Conservation Board
- Agencies involved in planning or undertaking conservation activities or activities that have conservation benefit. These include Environment Canterbury, Land Information New Zealand, New Zealand Defence Force, Te Manahuna Aoraki, Fish and Game and Water Zone Committees.



NATURE CONSERVATION VISION FOR THE WAITAKI CATCHMENT

The Waitaki catchment from a water-related conservation perspective – the big picture

The Waitaki catchment can be managed in an integrated way to deliver nature conservation value across the system. What follows is a description of that opportunity for the Lower Waitaki (below Lake Waitaki), the Upper Waitaki (in two sections: the basin rivers, Ōhau, Pukaki and Tekapo which are heavily impacted by the lake operating regimes; and lake and riverine environs above these basin rivers). We recognise there are connectivity questions, especially for fish, between these lower and upper sections.

Lower catchment opportunities

In the lower Waitaki we are working at scale to deliver a partially functioning ecosystem. Large islands and sections of the braid plain have been cleared of weeds, subject to effective predator control, and are supporting significant populations of key native bird species. Side streams, springs and wetlands are restored supporting native fish and birdlife; and the hapua is being managed to restore wetland vegetation and associated values. Key knowledge gaps such as for lizards, freshwater fish and terrestrial invertebrates have been identified and key gaps addressed, for example creation of weirs for freshwater fish in tributaries such as the Hakataramea. All this is achieved in a way that improves taonga species and mahika kai outcomes. Overall, the key components of the system are thriving through active management.

It is possible to achieve a partially functioning ecosystem, as envisaged above, on the Lower Waitaki while acknowledging and accepting the constraints imposed by the existing energy production system.

In the short term, this work will involve weed clearance and wetland enhancement, as well as predator control in some places. We see this work occurring at a large scale, but it will be highly co t effective. We believe that with the tools we currently have available, significant results can be achieved within a decade. As we proceed, we will learn more and be able to deliver more, cost effectively.

Some of this work will also have benefits to other parties; for example, braid plain weed clearance will benefit flood control for adjacent landowners and River Engine ring

We acknowledge there are some values that we do not currently have the knowledge to restore.

Connectivity between upper and lower catchments

Middle section - connectivity between the Lower Waitaki and the Upper Catchment will continue to be provided past the mainstream hydro-electricity dams for longfin eel (tuna), being diadromus native fish species present in the Upper Catchment that relies on connectivity to complete their life stages. There will also be lake margin work eg: Willow control at Deep Creek.

Upper catchment opportunities

In the Upper Catchment above Lake Benmore, we envisage managed functioning braided rivers and environs ecosystems <u>around and above</u> the existing storage lakes with very high nature conservation values. <u>Below</u> the storage lakes (Tekapo, Pukaki, Ōhau) we envisage protected and partially managed ecosystems, with a focus on protecting what remains.

We envisage thriving biodiversity in the upper catchment, especially around and above the storage lakes; management interventions in the non-impacted rivers are delivering biodiversity returns at a highly meaningful scale. We are working large scale, staging and learning as we go through the use of a science based adaptive management programme.

We are intervening in the impacted Tekapo, Ōhau and Pukaki rivers and environs to protect key species (including native fish and terrestrial invertebrates), while recognising the limits of this work due to operation of the scheme.

The restoration of thriving biodiversity values described above will improve the health of taonga species populations, as well as increasing the populations and types of mahika kai species and the opportunities for mahika kai practices.

DOC: 6954880

Prioritising and staging

Our approach will be to prioritise and appropriately stage the delivery of the nature conservation outcomes vision for all parts of the catchment described above.

Prioritisation will ensure the available resources are focussed on securing the greatest nature conservation gains, which will include collaboration and coordination with others and internal Departmental work.

The following outlines the staged approach for the upper catchment:

Stage 1 will have six elements:

- 1. In the Tekapo, Ōhau and Pukaki river reaches, which have reduced inflows, we will initially secure populations of species that are vulnerable to extinction. We will achieve this by appropriate habitat management, including predator and weed management, weir construction, management of disturbance, and reduction in abiotic pressures. We will work in a co-ordinated way to take advantage of spill-over (flood and planned) flows this will include mechanical bed disturbance to improve habitat for birds, and terrestrial inver ebrates.
- 2. In the lower reaches of the Tekapo, Ōhau and Ahuriri, and in wetlands, we will init ally improve habitat quality across the braid plain, while at the same time seek to secure substantive remaining wetlands. This habitat management work will start with a focus on woody and tall herbaceous weeds
- 3. We will continue to protect and enhance the existing high-quality values in the upper catchments. We will undertake targeted weed and predator management in the Tasman, Godley, Cass, MacAulay, Hopkins, Dobson, and Ahuriri rivers, and in the smaller foothills fed streams such as the Twizel, Edward, Grays, Irishman, Fork, Fraser, Omarama, Otamatapaio and Henburn.
- 4. For some existing values we have limited understanding of their ecology, distribution, and health. Without attention, these values will likely be lost, particularly where key pressures are high. Before we can decide what actions are required, we need to fill knowledge gaps. We will start this work on terrestrial invertebrate diversity, population status and distribution, and on lizard and freshwater fish population status, in selected habitats across the catchment.
- 5. For species and habitat values for which we do not have appropriate or affordable tools to manage key pressures, we will take an adaptive management approach to develop and hone methods before their wider application. This will include an initial focus restoration activities to better protect and enhance values.
- 6. For some habitat types, e.g., wetlands, seepages and side streams, habitat has been substantively lost in the catchment. We will seek out opportunities within the wider catchment area that secure and enhance these habitats. In those sites we will gain long-term legal protection of values and manage pressures that erode those values.

Stage 2 and beyond w I be built on the activities and knowledge gained in Stage 1. That will enable a focus on prioritising real biodiversity conservation outcomes and the enhancement of values in accordance with the nature conservation vision above.

DOC: 6954880

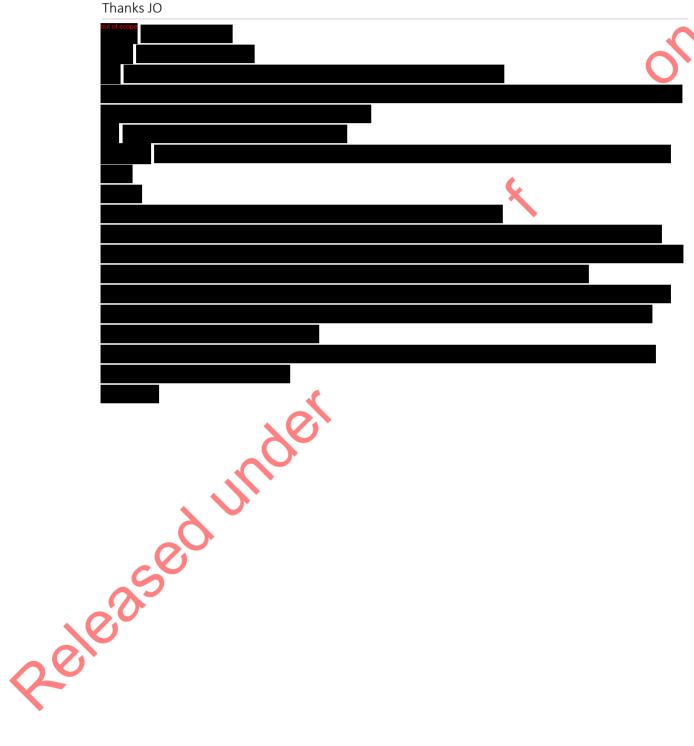
From: Jo Macpherson
To: Ken Hughey

Subject: FW: Initial DOC picture of a biodiversity rich Waitaki - DOC-6954880_Generators Version 4 (002)

Date: Thursday, 21 April 2022 8:50:33 am

Attachments: Initial DOC picture of a biodiversity rich Waitaki - DOC-6954880 Generators Version 4 (002).docx

Hi Ken, as we have been working outside the DOCCM system, I am now trying to find the last version of the high level document. I think?? This looks like the last one I sent to the Generators so think this should be the right version, can you perhaps check too?



From: Nicki Atkinson
To: Richard Maloney

Cc: Ken Hughey; Jo Macpherson

Subject: RE: Update on today"s negotiation mtg with the generators

Date: Tuesday, 12 April 2022 8:42:02 am

Mōrena Richard

Just spoke to Duncan re costs on lower Waitaki:

- \$40-70k per year for black fronted terns depending on how much flood damage there is to the artificial islands and includes ariel control of black backed gulls, weeding etc. Some of this comes from and/or for weeds and Merdian has contributed ~\$16k over 5 years to help with flood damage to islands
- Nga Awa work from his team, this year spent \$50k on baseline data gathering. They
 haven't really planned next year as the Nga Awa work there is still in relationship
 development phase and only really getting going. By way of comparison, his budget on the
 Rangitata for core management (weeding mostly) is \$200k per year plus another \$250k
 per year for work under the Nga Awa programme. Duncan suggested they could easily
 spend as much on the lower Waitaki.
- There might be some more spent from the Aquatic Unit Nga Awa budgets on the lower Waitaki I'm just waiting to hear back from Rosemary Millar on this.

Thanks,

Nicki

From: Ken Hughey <khughey@doc.govt.nz>

Sent: Friday, 8 April 2022 2:20 pm

Subject: Update on today's negotiation mtg with the generators

Dear all

Another good meeting with the generators today. Key points:

- 1. A couple of things to edit in the overall 'picture' document mostly minor so looking good. We have had the humbs up from Mike Slater for this internally. They have a little more work to do but are confident its close. So, well done.
- 2. There were two outstanding, but manageable, questions:
 - a. Native fish passage between the upper and lower catchment. There is an issue here tha I need to test I am not going to detail the 'genesis' of the issue as it is sensitive. Essentially the bottom line is that the species of importance to provide passage for is tuna/long finned eel and trap and carry works. They are not keen on anything else for a variety of reasons. I will need to talk to our freshwater fisheries people about this and have promised to do so by next meeting which is 13 April!

 Nicki who is key in this space as I need to get onto this?
 - b. Programme governance Jo and I are working on this.
- 3. We had a good chat about the draft/prototype Lower Waitaki scenario/option spreadsheet:
 - a. They liked the approach (but not a bit of the language I will work on that!) and understand how it could be negotiated around. Interestingly they thought scenario 3 would meet consenting requirements but want to do better than that whew! They want to see the costs and I will provide by Tuesday. I think Richard it would be good if we could estimate what DOC is doing and add that as there must be work in

the lower catchment, including overheads. I would appreciate just a rough estimate – given it is a nga awa river then this should help? Funnily enough, after I raised it yesterday in the technical group they raised black backed gulls (knowing it's a taonga species in the Ngai Tahu Treaty Settlement Act) – we had a good chat about this.

- b. We talked about how many of these we would prepare and to continue the house analogy, how many rooms are in the completed house (the big picture). I suggested 4 maybe 5. Ultimately if you think about the 'picture' that we have painted at a high level this is a picture of the house but without all of the rooms being built. We are now designing and adding rooms together they make a completed house and we have to really understand the details around the house and if any rooms are more important than others etc.
- c. We agreed the next room we should populate is for the Tekapo catchment as I signalled last week. How long will it take to prepare and present to the generators, but first via our internal working group? Richard, would you do that? You may have course have done it?

I think that was it. It was an open and honest meeting and they are incredibly thankful for our work.

Jo – I think that is it?
Thanks Ken

Chillips

From: Richard Maloney

To: Ken Hughey; Jo Macpherson; Colin O"Donnell; Nicki Atkinson

Subject: Draft Scenarios for levels of value management Tekapo system.xlsx

Date: Tuesday, 12 April 2022 8:27:05 am

Attachments: Draft Scenarios for levels of value management Tekapo system.xlsx

Importance: High

Morena Ken and Jo

Here's a first go at the Tekapo system values and scenarios. Some notes:

- 1. I've only described the Tekapo River, not the Lake levels, The values lost under the lake, lake water table impacts, delta impacts -that should be a different parallel doco
- 2. Only the two green tabs haven't finished the costings yet sorry. I will base the costs in Lewis doco she did for the land transfer, which came from Lewis and Maloney with some updates. She took an additive action approach to mgmt in that doco so not useful (ie do current weeds, then add predators, then add restoration of other stuff)
- 3. I've followed the LWaitaki approach of proportional scenarios, but with a few differences. Note that they read very similar because the size of the two river braid plains and length is actually very similar.

The description text is fairly long now — may be better as bullets (what is the point of this text?? I use the treatment tab info when I want to compare differences)). Lhaven thad a chance to proof this — so would pay for someone to match up the description text against the treatment tab.

Cheers

Richard

eleased under

Situation Raised lake levels have inundated large areas of wetland, braided river and other habitats. Modified lake fluctuations change the dynamics of water tables and impact on lake edge habitats. River flow dynamics over the full length of the Tekapo River Values Many braided bird and frestiwater fish values still present, but depleted and under threat. Native lizard, freshwater fish, bird and plant values known, but fine-scale distributions and populations trends poorly understood. Terrestrial invertebrate values Length and reason has in area.

Provide a Di Cearde disards to immediately to secure threatened species. Add porceitor control in cleared areas because river flows no longer large enough (% current) in receivant control in a wildle remains sepages and wetlands adjacent to the river and policitions are secured. Recover all variables remains sepages and wetlands adjacent to the river and policitions are secured. Recover and the variables are secured and provides mention of the provides and an adjacent to the river and policitions are secured. Recover and the remains sepages and wetlands adjacent to the river and provides owns from the provides owns from the provides owns from provides owns from the provides owns from th			Scenario 2: Moderate protection of values in limited areas	Scenario 3: Do minimal levels of protect
obsilie of a sociated wetlands are re-establised and are managed to provide management products (Saps in knowledge for taxa and pressures are filled and active on managed. Life delin growing habitat. Gaps in knowledge for taxa and pressures are filled, and key gaps are acted on commen of scale. Adaptive approaches are used. Focus is on management of all braided river species in the braid plain and water. Islands around 1-10 ha created every 2ma and these islands are eventually subsumed under clearance of the active channel for the river (at 10 has its 1.2% of in darea cleared), and these islands are eventually subsumed under clearance of the active channel for southers (200% of river length, then is managed and cleared at Sam per very for 10 years to achieve 100% of river length, then is managed and cleared as the provision of the braid plain, and on freshwater fish habitats in the wettand areas. Ten islands around 1 har created every 4 and along the length of the river (12.2% of indin drace cleared), and these islands are eventually subsumed under clearance of the active channel for southers are used. Focus is on management of all braided river species in a daptive approaches are used. Focus is on management of all braided river species in the braid plain, and on freshwater fish habitats in the wettand areas. Ten islands around 1 har created every 4 management ten in the river for 10 years to achieve 100% of river length, then is managed at diver and is a miderated to a management received. The production is control of the seed of the production of the river (12.2% of indin drace cleared), and 1 har created every 4 management and of the very 4 management received. The production is carried out, and all key findings are implemented. Management of the seed of the production is carried out, and all key findings are implemented. The production is carried out, and all key findings are implemented. The production is carried out, and all key findings are implemented. The production is carried out, and all collowing	Key actions	Remove woody and herbaceous weeds from all islands and active channel areas along the full river length. Remove all woody weeds from the Wider braid plain in the Upper river, above the gorge. Remove woody weeds from the True Right of lower river to reconnect braid plain and PCL. With the riverbed. Leave willows on True left bank of lower river where needed for flood protection. Provide 10 cleared islands to immediately to secure threatened species. Add predator control in cleared areas because river flows no longer large enough (>6 cumecs per channel) to provide mammal predator security. Recover half of all available remnant seepages and wetlands adjacent to the river, including replacement of exotic trees with native vegetation around spring feed seepages (Pukaki ponds, Upper Tekapo seepages). Provide adequate off-site habitat management at 10 sites to protect native freshwater fish values that cannot be protected in situ including in some areas feeding into nearby side streams. Fill knowledge gaps in lizards and terrestrial invertebrates, and in native fish management (e.g., how to control monkey musk) and act on all key findings. Manage weed pressures which are exacerbated by low and controlled flows. Islands with small flows are accessible to evhicles, so actively work	Scenario 2 key actions Establish and maintain 10 islands and 5 x 5km sections of braid plain (50% of available braid plain), so that threatened bird and invertebrate populations are secured. Recover 80% of all available remnant seepages and wetlands adjacent to the river and provide some fish protection at 8 sites in nearby side streams. Fill knowledge gaps in lizards and terrestrial invertebrates, and in native fish management and act on key findings. At restored sites, manage weed and predator pressures.	Scenario 3 key actions Establish and maintain 10 island: km of braid plain (10% of available braid plain), so that t and invertebrate populations are present. Recover half-remnant seepages and wetlands adjacent to the river ar fish protection at 5 sites in nearby side streams. Fill kno lizards and terrestrial invertebrates, and in native fish m act on key findings. At restored sites, manage weed and pressures.
species in the braid plain and water. Islands around 1-10 ha created every Xm along the length of the river (at 10 has his is 12.95 of land are acleaved), and these islands are eventually subsumed under clearance of the active channel areas. The active channel is managed and cleared at Sine per year for 10 years to achieve 100% of river length, then is managed at this level. Use of spill food flows to help with weed management is understood. Research into terrestrial invertebrate and lizard fauna distribution and diversity, and management methods, and into better management techniques for freshwater fish populations is carried out, and all key findings are implemented. Management the related pollutions is carried out, and all key findings are implemented. Management is understood, Research into terrestrial invertebrate and lizard fauna distribution, and diversity, and management techniques for freshwater fish populations is carried out, and all key findings are implemented. Management the findings are implemented and replaced to the first of the pollutions productions of the pollutions productions carried out, and all key findings are implemented. Management the first of the pollutions productions of the view of the pollutions of the view of the pollutions productions of the view of the view of the pollutions production of the view of the pollutions productions of the view of the pollutions productions of the view of	management	plain and associated wetlands are re-establised and are managed to provide habitat. Gaps in knowledge for taxa and pressures are filled and acted on. Management costs are reduced as source of weeds decreases and with		Populations retained for some taxa, thers unanaged wetland and river habitat managed. Lim ed im rovem of taxa and pressures, and this trates to management findings.
and followup management techiques (e.g., during outages or high lake levels/inflows) to enhance habitat and remove weeds is investigated. Willow and other woody weed clearance from wetlands and restorative wetland planting. Additional enhancement of braided river values by tweaking activities around flood control works. Targetted invertebrate and litard sampling in a range of habitats across the full length of the site, with further actions adopted once results known. Weir building and trout removal in smaller nearby streams and seepages to benefit threatened fish. Freshwater fish populations protected and recovering at these sites. Management by others Mendian fairway clearance act is the rest of he site, and flood control works and e.g., protection of the iron bridge continues. DOC Nga awa programme ontinues and includes wider land use impacts on the freshwater system.	Focus detail	species in the braid plain and water. Islands around 1-10 ha created every 2km along the length of the river (at 10 ha this is 1.2% of land area cleared), and these islands are eventually subsumed under clearance of the active channel areas. The active channel is managed and cleared at 5km per year for 10 years to achieve 100% of river length, then is managed at this level. Use of spill flood flows to help with weed management is understood. Research into terrestrial invertebrate and lizard fauna distribution and diversity, and management needs, and into better management techniques for freshwater fish populations is carried out, and all key findings are implemented. Management of threatened fish populations occurs in nearby side streams to replace seepage habitats no longer present/fecoverable in the Tekapo	the braid plain, and on freshwater fish habitats in the wetland areas. Ten islands around I ha+ created every 4km along the length of the river (0.25% of land area cleared), and the braid plain is managed and cleared in 5 x 5 km sections of the river (50% of river length). Managed areas are maintained with predator and weed control. Use of spill flood flows to help with weed management is understood. Research into terrestrial invertebrate and lizard fauna distribution and diversity, and management needs, and into better management techniques for freshwater fish populations is carried ut, and all key findings are implemented. Management of threatened fish populations of urs.	Adaptive approace is are ned. Focus is on managementerns, kaki an iba ded dott als in the braid plain, and habitat in the seepag areas. "Di slands of at least 1 h manage (0.2 % of land area). Only short sections of clear and man jed (10% of river length). Managed a maintain it with predator and weed control. Use of spielp, the wide management is understood. Research inverte. ate and lizard fauna distribution, diversity and needs, ind into better management techniques for free populations is carried out.
Management by others by the braid plain clearance work. Any flood control works and e.g., protection of the iron bridge continues. Nga awa programme continues and includes wider land use impacts on the freshwater system. Nga awa programme continues, and includes wider land use impacts on the freshwater system.		and followup management techiques (e.g., herbicides). The best use of spill flows (e.g., during outages or high lake levels/inflows) to enhance habitat and remove weeds is investigated. Willow and other woody weed clearance from wetlands and restorative wetland planting. Additional enhancement of braided river values by tweaking activities around flood control works. Targetted invertebrate and lizard sampling in a range of habitats across the full length of the site, with further actions adopted once results known. Weir building and trout removal in smaller nearby streams and seepages to benefit threatened fish. Freshwater fish populations protected and recovering at these sites.	techiques, willow clearance from wetlands and rest. the we land planting, Targetted predator and weed control to cleared areas. Tarr, tred reter , e and lizard sampling in a range of habitats across the full length of this site with , ther actions adopted once results known. Weir building and trout emovy in smaller streams and seepages to benefit threatened fish. T	
or the from bridge communes. It is the freshwater system.		woody weed management continues and is eventually superceded by the braid plain clearance work. Any flood control works and e.g., protection	Meridian fairway clearance across the rest of the site, and flood control works continue. DOC Nga awa programme ontinues and includes wider land use impacts on	Meridian fairway clearance and flood control w Nga awa programme continues, and includes wider l
od III. gel	others			
		26		

Tekapo River Activities	Calculations	Scenario 1: High levels of values protected at ecologically meaningful scales	Scenario 2: Moderate protection of values in limited areas	Scenario 3: Do minimal levels of protection
Islands creation	At 1 ha each	10 initial islands	10 islands	10 islands
	At full replacement every 10 years (10%			
Islands replacement	per annum)	not needed	1 island replaced per annum	1 island replaced per annum
Braid plain clearance	at 50-100 ha per km (48 km)	48 km braid plain cleared	25 km braid plain cleared	5 km braid plain cleared
	At islands + braid plain in ha at 30% of	~4000 ha area in riverbed (1200 ha weed	~2000 ha area created (600 ha of weed	~400 ha area created (120 ha of weed
Weed maintenance - cleared areas	habitat area created	mgmt)	mgmt)	mgmt)
Small mammal predator mgmt at cleared				
areas	At islands + braid plain in ha	48 km islands and bank areas	25 km islands and bank areas	5 km islands and bank areas
Black backed gull predator control	At colonies	100% estimated at 3 colonies	100% estimated at 3 colonies	100% estimated at 3 colonies
	At 1 wetland seepage area per 1 km 48			4
	per side 96 in total At 1ha per wetland			
Wetlands cleared	96 ha	100% 100 ha of wetlands	80% 80 ha of wetlands	50% 50 ha of wetlands
	At 1 wetland seepage area per 1 km 48			
1	per side 96 in total At 1ha per wetland			
Wetlands restored planting, fencing	96 ha	100% 1000 plants	80% 800 plants	50% 500 plants
Offsite native fish protection using weirs and pest fish removal	At \$31300 average annual cost per weir including pest removal, and replacement costs. Offset lost sidestream water table habitat at 1 weir per 5km of river length equivalent 10 weirs	100% 10 weirs built, maintained and pest fish removed	80% 8 weirs built, maintained and pest fish removed	50% weirs uilt, tained and pest fish emoved
Knowledge gaps filled Application of key findings from knowledge gaps	At \$30k each per annum for 3 years for lizards and fish, and \$80k per annum for invertebrates on land for 5 years (includes sorting and referencing costs). Nominally at \$100k each for lizards, fish and terr inverts from year 6.	Distribution and diversity of lizards, terrestrial invertebrates, fish identified All (100%) of key recommendations taken up	Distribution and diversity of lizards, terrestrial invertebrates, fish ident Most (80%) of recommendation taken up	Distr ion and diversity of lizards, terr trial invertebrates, fish identified Highest priority (50%) of recommendations taken up
			INION	
		Scenario 3 key ac ons E tabli d'maintain the braid plair at a e of 2 km per annum over 24 years to chieve 100% of available		

Key actions	Calculations	Scenario 3 key ac ons. E tabli. d'maintain the braid plai at a e of 2 km per annum over 24 years to chieve 100% of available braid pl. Provid. sland. over 1.2% of land are immediate to se ure threatened spe. es. Recover il lkey wetlands and side strea s as part if a connected braid plain, and further p e adequate off-site habitat management to protect native freshwater fish values that cannot be protected in situ. Fill owledge gaps in lizards and terrestrial invertebrates, and in native fish management and act on key findings, including finding solutions to barriers to migration. Manage weed and predator pressures which are exacerbated by low and controlled flows.	of braid plain (24% of available braid plain), so that threatened bird populations are secured. Recover most key wetlands and side streams. Fill knowledge gaps in lizards and terrestrial invertebrates, and in native fish management and act on key findings. At cortected lists, manage ward.	Scenario 1 key actions Establish and maintain 15 islands and 4 x 2km sections of exemplar braid plain, including weed and predator control. Recover key wetlands and side streams. Fill knowledge gaps in lizards and terrestrial invertebrates, and in native fish management.
20/08	5801111			

Scenario 1 Scenario 2 Scenario 3 Weed control. Upper Tekapo 5120,000 \$120,0	Scenario 1 Scenario 2 Scenario 3 Task Set-up Ongoin Current 5x/s current effort 3x/s current effort current effort River Current 5x/s current effort 3x/s current effort current effort Weed control: Upper Tekapo \$120,000		protected at ecologically	Scenario 2: Moderate protection of values in limited areas	Scenario 3: Do minimal levels of protection			
Current Sx's current effort 3x's current effort current effort Current Sx's current effort 3x's current effort current effort Sx's current effort 3x's current effort current effort Current 8x's current effort 5x's current effort current effort Current effort Sx's current effort Sx's current effort Current effort current effort Current effort Sx's current effort Current effort Sx's current effo	Current 5x's current effort 3x's current effort current effort Current 5x's current effort 3x's current effort current effort Sx's current effort 3x's current effort current effort Current 6x's current effort 5x's current effort current effort Southern black-backed gull squares 33,000 43,000 500 500 500 500 500 500 500 500 500		meaningful scales Scenario 1			Tack	Set-up	Ongoin
Current Sx's current effort 3x's current effort current effort Sx's current effort 3x's current effort current effort Sx's current effort current effort Sx's current effort current effort Countrol Below gates \$2,000 \$43,000 Southern black-backed gull \$4,150 \$4,150 Southern black-backed gull \$4,150 Southern blac	Current Sx's current effort 3x's current effort current effort Sx's current effort 3x's current effort current effort Sx's current effort current effort current effort Sx's current effort Current effort Current effort Sx's current effort Current effort Sx's current effort Sx's current effort Current effort Sx's current effort Current effort Sx's current effort Sx's current effort Current effort Sx's current effort Sx'		Scenario 1	Scenario 2	Scellatio 5			Ongoing
Current Sx's current effort 3x's current effort current effort Sx's current effort Sx'	Current Sx's current effort 3x's current effort current effort Schemer black backed gull substitution of the state of the	Current	5x's current effort	3x's current effort	current effort		\$120,000	\$120,000
Current 8x's current effort 5x's current effort current effort current effort session 48 km trapped 24 km trapped 5 km trapped around islanc Cats and possums \$68,700 \$333.7 Restoration 48 km trapped 24 km trapped 5 km trapped around islanc Ferrets \$113,725 \$344.5 Restoration 48 km trapped 24 km trapped 5 km trapped around islanc Ferrets \$113,725 \$344.5 Restoration All banks in lower 15km clee Banks in lower 5 km clearer No banks in lower river clee Clearing banks \$139,000 \$122.8 Restoration yes Y	Current 8x's current effort 5x's current effort current effort current effort session 48 km trapped 24 km trapped 5 km trapped around island Cats and possums \$63,700 \$33,77 Restoration 48 km trapped 24 km trapped 5 km trapped around island Season \$100,000						\$2,000	\$2,000
Current 8x's current effort 5x's current effort 6x84.50 (194.50) Restoration 48 km trapped 24 km trapped 5 km trapped around island Ferrets 1811,2725 1834.5 Restoration 48 km trapped 24 km trapped 5 km trapped around island Stoats, hedgehogs, rats 1819,000 1822.6 Restoration All banks in lower 15km cle Banks in lower 5 km clearet. No banks in lower river cles Clearing banks 1819,000 1822.6 Restoration yes yes yes Minimising disturbance 1818,900 1812.6 Restoration yes yes yes Minimising disturbance 1818,900 1810.5 Rull restoration 3 fenced areas 1 fenced area no fenced areas Predator fences 7779,700 1817.00 Rull restoration 5 spp 3 spp 1 spp Translocations for biodiversity 187,200 1810.000 Full restoration 5 spp 3 spp 1 spp Plant translocations 1815,000 1810.000 Full restoration 5 wetlands created 3 wetlands created 1 wetland created Wetland creation 1816 (60ha) 50% (37ha) 20% (15ha) Clearing islands 182,000 182,000 Rull restoration yes yes yes Southern black-back digits 183,000 183,000 Full restoration yes yes yes Southern black-back digits 183,000 183,000 Full restoration 5 weirs built 3 weirs built no weirs built Predatory fish 33,11,00 181,000 \$1,017,700 \$207,600 \$1,017,700 \$207,600 \$1,000	Current 8x's current effort 8x's current effort 6x current effo	04112111						ψ3,000
Restoration 48 km trapped 24 km trapped 5 km trapped around island Cats and possums \$63,700 \$33.7 Restoration 48 km trapped 24 km trapped 5 km trapped around island Stoats, hedgehogs, rats \$13,785 \$39.4 Restoration All banks in lower 15km cle Banks in lower 5 km clearet No banks in lower river cles Clearing banks \$199,000 \$222.8 Restoration yes yes yes Stock fencing \$20,000 \$1.5 Restoration yes yes yes Minimising disturbance \$118,900 \$10.5 Full restoration \$5 spp \$3 spp \$1	Restoration 48 km trapped 24 km trapped 5 km trapped around island Cats and possums \$63,700 \$33.7 Restoration 48 km trapped 24 km trapped 5 km trapped around island Senets, hedgehogs, rats \$13,725 \$34.5 Restoration All banks in lower 15km cle Banks in lower 5 km clearet No banks in lower river cler Clearing banks \$199,000 \$422.5 Restoration yes yes yes Yes Stock fencing \$20,000 \$1.9 Restoration yes yes yes Minimising disturbance \$18,890 \$10.5 Full restoration \$5 spp \$3 spp \$1 spp	Current	8x's current effort	5x's current effort	current effort	J	\$4,150	\$4,150
Restoration 48 km trapped 24 km trapped 5 km trapped around island Ferrets \$113,725 \$34.5 Restoration 48 km trapped 24 km trapped 5 km trapped around island Stoats, hedgehogs, rats \$103,615 \$34.5 Restoration 48 km trapped 24 km trapped 5 km cleare No banks in lower river clear Clearing banks \$100,005 \$34.5 Restoration yes yes yes Stock fencing \$20,000 \$1.5 Restoration yes yes yes Minimising disturbance \$18,800 \$10.00 Pull restoration 3 fenced areas 1 fenced area no fenced areas Predator fences \$773,700 \$10.000 Pull restoration 5 spp 3 spp 1 spp Pull restoration 5 spp 3 spp 1 spp Climate change translocation \$15,000 \$10.000 Pull restoration 5 wetlands created 3 wetlands created 1 wetland created Wetland creation \$27,000 \$20.000 Pull restoration 80% (60ha) 50% (37ha) 20% (15ha) Clearing islands \$26,500 \$25,000 Pull restoration yes yes yes Southern black-back 8 gu is \$31,000 \$20.000 Pull restoration yes yes yes Lagomorph control \$30,000 \$30,000 \$30,000 Pull restoration \$30,000 \$	Restoration 48 km trapped 24 km trapped 5 km trapped around island Ferrets \$113,725 \$34.5 Restoration 48 km trapped 24 km trapped 5 km trapped around island Stoats, hedgehogs, rats \$103,615 \$34.5 Restoration 48 km trapped 24 km trapped 5 km trapped around island Stoats, hedgehogs, rats \$103,615 \$34.2 Restoration yes yes yes yes Stock fencing \$20,000 \$1.9 Restoration yes yes yes yes Minimising disturbance \$18,890 \$10.5 Full restoration 3 fenced areas 1 fenced area no fenced areas Predator fences \$773,700 \$2.000 \$1.00 Pull restoration 5 spp 3 spp 1 spp Pull restoration 5 spp 3 spp 1 spp Climate change translocation \$15,000 \$10,000 Pull restoration 5 wetlands created 3 wetlands created 1 wetland created Wetland creation \$27,000 \$12,000 Pull restoration 80% (60ha) 50% (37ha) 20% (15ha) Clearing islands \$22,600 \$25,600 Pull restoration in 3 fenced areas in 1 fenced area in no fenced areas Mice control \$14,900 \$20,000 Pull restoration yes yes yes Southern black-back 8 dg ul is \$35,100 \$10,000 Pull restoration 5 weirs built no weirs built Predatory fish \$31,100 \$1,000 Pull restoration All side streams controlled 50% of side streams control 30% of side streams control \$20,000 Pull restoration \$20,000 Pull rest	Restoration	48 km trapped	24 km trapped	5 km trapped around islan		\$63,700	\$33,70
Restoration 48 km trapped 24 km trapped 5 km trapped around island Stoats, hedgehogs, rats \$103,615 \$34.5 Restoration All banks in lower 15km cle Banks in lower 5 km clearet No banks in lower river cless Clearing banks \$199,000 \$222.5 Restoration yes yes yes Minimising disturbance \$138,000 \$1.5 Restoration yes yes yes Minimising disturbance \$138,000 \$1.05 Restoration \$15 spp \$1	Restoration 48 km trapped 24 km trapped 5 km trapped around island Stoats, hedgehogs, rats 4103,613 334.5 Restoration All banks in lower 15km cle Banks in lower 5 km clearet No banks in lower river cles Clearing banks 199,000 \$222.5 Restoration yes yes yes Minimising disturbance \$18,900 \$1.05 Full restoration 3 fenced areas 1 fenced area no fenced areas Predator fences \$773,700 \$2.00 Full restoration 5 spp 3 spp 1 spp Climate change translocation \$15,000 \$1.00 Full restoration 5 spp 3 spp 1 spp Climate change translocation \$15,000 \$1.00 Full restoration 5 swetlands created 3 wetlands created 1 wetland created Wetland creation \$22,000 \$22,00 \$20 \$20 \$20 \$20 \$20 \$20 \$20 \$20 \$20 \$			• • •				
Restoration All banks in lower 15km cle Banks in lower 5 km clearer No banks in lower river cles Clearing banks Restoration yes yes yes Stock fencing \$20,000 \$11,5 Restoration yes yes yes Minimising disturbance \$18,900 \$10,5 Full restoration 5 spp 3 spp 1 spp Full restoration 6 swellands created 1 wetland created Wetland creation 5 spp 3 spp 1 spp Full restoration 1 special spp 1 spp 1 spp 1 spp 1 spp 1 spp 2 spp 2 spp 2 spp 2 spp 3 spp 3 spp 3 spp 3 spp 4 spp 4 spp 4 spp 5 spp 5 spp 6 s	Restoration All banks in lower 15km cle Banks in lower 5 km clearer No banks in lower river clear Clearing banks \$199,000 \$222.5 Restoration yes yes yes Stock fencing \$20,000 \$1.9 Restoration yes yes yes Minimising disturbance \$118,900 \$15.00 \$1.0 Predator fences \$779,700 \$2.700 \$2.100 \$1.0 Pull restoration \$5 spp \$3 spp \$1 spp \$			• • •				
Restoration yes yes yes yes Minimising disturbance \$18,900 \$1.5 Restoration yes yes yes Minimising disturbance \$18,900 \$1.0 Full restoration 3 fenced areas 1 fenced area no fenced areas Predator fences \$779,700 \$2,100 Full restoration 5 spp 3 spp 1 spp Climate change translocations \$15,000 \$10,000 Full restoration 5 swellands created 3 wetlands created 1 wetland created Full restoration 5 wetlands created 3 wetlands created 1 wetland created Wetland creation \$2,700 \$2,000 Full restoration in 3 fenced areas in 1 fenced area in no fenced areas Mice control \$14,900 \$20,100 Full restoration yes yes yes Southern black-back 1 gu ts \$35,100 \$35,000 Full restoration 5 weirs built 9 were sound 50% of side streams control 5 weirs built 1 such as a such as	Restoration yes yes yes Minimising disturbance \$18,900 \$1.05 Full restoration 3 fenced areas 1 fenced area no fenced areas Predator fences \$779,700 \$2.100 Full restoration 5 spp 3 spp 1 spp Climate change translocations \$15,000 \$10,000 Full restoration 5 swellands created 3 wetlands created 1 wetland created Full restoration 5 swellands created 3 wetlands created 1 wetland created Full restoration in 3 fenced areas in 1 fenced area in no fenced areas Mice control \$12,000 \$25,000 Full restoration yes yes yes Southern black-back d gulls \$35,000 \$25,000 Full restoration yes yes yes Lagomorph control \$30,000 \$42,000 Full restoration Swelradion \$30,000 \$42,000 Full restoration All side streams controlled 50% of side streams control \$30,000 \$42,000 Full restoration All side streams controlled 50% of side streams control \$40,000 \$42,000 Full restoration All side streams controlled 50% of side streams control \$40,000 \$42						i —	_
Restoration yes yes yes Minimising disturbance \$13,900 \$10.5 Full restoration 3 fenced areas 1 fenced area no fenced areas Predator fences \$779,700 \$2.00 Full restoration 5 spp 3 spp 1 spp Climate change translocation \$15,000 \$10,000 Full restoration 5 spp 3 spp 1 spp Plant translocations \$2,700 \$2.00 Full restoration 5 wetlands created 3 wetlands created 1 wetland created Full restoration 80% (60ha) 50% (37ha) 20% (15ha) Clearing islands \$26,600 \$25,600 Full restoration yes yes yes Southern black-back 8 gu ls \$35,000 \$25,000 Full restoration yes yes yes Lagomorph control \$60,200 \$62,200 \$62,200 Full restoration All side streams controlled 50% of side streams control 30% of side streams control Aquat cwell done on \$10,000 \$207,600 \$20,000 \$	Restoration yes yes yes yes Minimising disturbance \$18,900 \$10,50 Full restoration 3 fenced areas 1 fenced area no fenced areas Predator fences \$779,700 \$3,000 Full restoration 5 spp 3 spp 1 spp Climate change translocation \$15,000 \$10,000 Full restoration 5 spp 3 spp 1 spp Plant translocations \$2,700 \$2,000 Full restoration 5 wetlands created 3 wetlands created 1 wetland created Full restoration 80% (60ha) 50% (37ha) 20% (15ha) Clearing islands \$25,600 \$25,600 Full restoration yes yes yes Southern black-back 3 gu ls \$35,000 \$35,000 Full restoration yes yes yes Southern black-back 3 gu ls \$35,000 \$35,000 Full restoration 5 weirs built no weirs built Predatory fish \$31,100 \$4,100 \$10,000 \$207,600							
Full restoration 3 fenced areas 1 fenced area no fenced areas Predator fences \$779,700 \$9,700 Full restoration 5 spp 3 spp 1 spp Climate change translocations of biodiversity \$7,200 \$2,100 Full restoration 5 spp 3 spp 1 spp Climate change translocation \$15,000 \$10,000 Full restoration 5 spp 3 spp 1 spp Plant translocations \$2,700 \$2,300 Full restoration 5 wetlands created 3 wetlands created 1 wetland created Wetland creation \$37,200 \$2,400 Full restoration 80% (60ha) 50% (37ha) 20% (15ha) Clearing islands 326,600 \$25,600 Full restoration in 3 fenced areas in 1 fenced area in no fenced areas Mice control \$14,900 \$20,100 Full restoration yes yes yes Southern black-back digular \$35,000 \$35,000 Full restoration 5 weirs built 3 weirs built no weirs built Predatory fish \$31,100 \$4,100 Full restoration All side streams controlled 50% of side streams control \$30% of side streams control \$30% of side streams control \$4,000 \$3,000 \$5,00	Full restoration 3 fenced areas 1 fenced area no fenced areas Predator fences \$779,700 \$2,700 Full restoration 5 spp 3 spp 1 spp Climate change translocation \$15,000 \$10,000 Full restoration 5 spp 3 spp 1 spp Plant translocations \$2,700 \$2,200 Full restoration 5 swetlands created 3 wetlands created 1 wetland created Wetland creation 537,200 \$2,400 Full restoration 80% (60ha) 50% (37ha) 20% (15ha) Clearing islands \$26,600 \$25,600 Full restoration in 3 fenced areas in 1 fenced area in no fenced areas Mice control \$14,900 \$20,100 Full restoration yes yes yes Southern black-back digit a \$35,200 \$45,200 Full restoration 5 weirs built 3 weirs built no weirs built Predatory fish \$31,100 \$41,100 Full restoration All side streams controlled 50% of side streams control \$30% of side streams control \$40 for side streams control		•	•	•			
Full restoration 5 spp 3 spp 1 spp Climate change translocations \$15,000 \$10,000 Full restoration 5 spp 3 spp 1 spp Plant translocations \$2,700 \$2,300 Full restoration 5 wetlands created 3 wetlands created 1 wetland created Wetland creation \$37,200 \$2,300 Full restoration 80% (60ha) 50% (37ha) 20% (15ha) Clearing islands \$22,600 \$25,600 \$25,600 \$20,100 Full restoration in 3 fenced areas in 1 fenced area in no fenced areas Mice control \$14,900 \$20,100 Full restoration yes yes yes Southern black-back diguls \$35,100 \$35,000 Full restoration yes yes yes Lagomorph control \$83,200 \$63,200 Full restoration 5 weirs built 3 weirs built no weirs built Predatory fish \$31,100 \$4,100 \$10,107,700 \$207,600 \$20,000 \$	Full restoration 5 spp 3 spp 1 spp Climate change translocation \$15,000 \$10,000 Full restoration 5 spp 3 spp 1 spp Plant translocation \$2,700 \$2,300 Full restoration 5 wetlands created 3 wetlands created 1 wetland created Wetland creation \$37,200 \$2,300 Full restoration 80% (60ha) 50% (37ha) 20% (15ha) Clearing islands \$26,600 \$25,600 \$21,000 Full restoration in 3 fenced areas in 1 fenced area in no fenced areas Mice control \$14,900 \$20,100 Full restoration yes yes yes Southern black-back if gurls \$35,100 \$35,000 Full restoration 5 weirs built 3 weirs built no weirs built Predatory fish \$31,100 \$4,100 Full restoration All side streams controlled 50% of side streams control 30% of side streams control \$20,000		•	•	•		\$18,900	\$10,50
Full restoration 5 spp 3 spp 1 spp Climate change translocation \$15,000 \$10,000 Full restoration 5 spp 3 spp 1 spp Plant translocations \$2,700 \$2,300 Full restoration 80% (60ha) 50% (37ha) 20% (15ha) Clearing islands \$26,000 \$22,600 Full restoration in 3 fenced areas in 1 fenced area in no fenced areas Mice control \$14,900 \$20,100 Full restoration yes yes yes Southern black-back d gulls \$35,100 \$35,000 Full restoration yes yes Lagomorph control 50%,200 \$6,200 Full restoration 5 weirs built no weirs built Predatory fish \$31,100 \$41,100 Full restoration All side streams controlled 50% of side streams control 30% of side streams control \$40,000 \$50,	Full restoration 5 spp 3 spp 1 spp Climate change translocation \$15,000 \$10,000 Full restoration 5 spp 3 spp 1 spp Plant translocations \$25,700 \$2,300 Full restoration 5 swetlands created 1 wetland created Wetland creation \$37,200 \$2,400 Full restoration 10 specific specif	Full restoration	3 fenced areas	1 fenced area	no fenced areas	Predator fences	\$779,700	\$94 700
Full restoration 5 spp 3 spp 1 spp Plant translocations \$2,000 \$2,300 Full restoration 5 wetlands created 3 wetlands created 1 wetland created Wetland creation 537 200 \$2,400 Full restoration 80% (60ha) 50% (37ha) 20% (15ha) Clearing islands \$26,600 \$25,600 Full restoration in 3 fenced areas in 1 fenced area in no fenced areas Mice control \$14,900 \$2,0100 Full restoration yes yes yes Southern black-back d gu ls \$35,100 \$35,200 Full restoration yes yes yes Lagomorph control \$63,200 \$6,200 Full restoration 5 weirs built 3 weirs built no weirs built Predatory fish \$31,100 \$4,100 Full restoration All side streams controlled 50% of side streams control 30% of side streams control Aquatic we doon rol \$5,000 \$5,000 \$1,017,700 \$207,6	Full restoration 5 spp 3 spp 1 spp Plant translocations \$2,700 \$2,300 Full restoration 5 wetlands created 3 wetlands created 1 wetland created Wetland creation \$37,200 \$2,400 Full restoration 80% (60ha) 50% (37ha) 20% (15ha) Clearing islands \$26,600 \$25,600 Full restoration in 3 fenced areas in 1 fenced area in no fenced areas Mice control \$14,900 \$20,100 Full restoration yes yes yes Southern black-back d gu ls \$35,100 \$35,100 Full restoration yes yes yes Lagomorph control \$63,200 \$45,000 Full restoration 5 weirs built 3 weirs built no weirs built Predatory fish \$31,100 \$44,100 Full restoration All side streams controlled 50% of side streams control 30% of side streams control Aguar cwe d control \$5,000 \$5,000 \$5,000 \$20,760 \$1,017,700 \$207,6	Full restoration	5 spp	3 spp	1 spp	Translocations for biodiversity	\$7,200	\$2,100
Full restoration 5 spp 3 spp 1 spp Plant translocations \$2,000 \$2,300 Full restoration 5 wetlands created 3 wetlands created 1 wetland created Wetland creation 537 200 \$2,400 Full restoration 80% (60ha) 50% (37ha) 20% (15ha) Clearing islands \$26,600 \$25,600 Full restoration in 3 fenced areas in 1 fenced area in no fenced areas Mice control \$14,900 \$2,0100 Full restoration yes yes yes Southern black-back d gu ls \$35,100 \$35,200 Full restoration yes yes yes Lagomorph control \$63,200 \$6,200 Full restoration 5 weirs built 3 weirs built no weirs built Predatory fish \$31,100 \$4,100 Full restoration All side streams controlled 50% of side streams control 30% of side streams control Aquatic we doon rol \$5,000 \$5,000 \$1,017,700 \$207,6	Full restoration 5 spp 3 spp 1 spp Plant translocations \$2,700 \$2,300 Full restoration 5 wetlands created 3 wetlands created 1 wetland created Wetland creation \$37,200 \$2,400 Full restoration 80% (60ha) 50% (37ha) 20% (15ha) Clearing islands \$26,600 \$25,600 Full restoration in 3 fenced areas in 1 fenced area in no fenced areas Mice control \$14,900 \$20,100 Full restoration yes yes yes Southern black-back d gu ls \$35,100 \$35,100 Full restoration yes yes yes Lagomorph control \$63,200 \$45,000 Full restoration 5 weirs built 3 weirs built no weirs built Predatory fish \$31,100 \$44,100 Full restoration All side streams controlled 50% of side streams control 30% of side streams control Aguar cwe d control \$5,000 \$5,000 \$5,000 \$20,760 \$1,017,700 \$207,6	Full restoration	Fenn	3 500	1.000	Climate change translocation	\$15,000	\$10,000
Full restoration 5 wetlands created 3 wetlands created 1 wetland created Full restoration 80% (60ha) 50% (37ha) 20% (15ha) Clearing islands \$26,600 \$25,600 \$25,600 \$20,100 \$2	Full restoration 5 wetlands created 3 wetlands created 1 wetland created Full restoration 80% (60ha) 50% (37ha) 20% (15ha) Clearing islands \$26,600 \$25,600 Full restoration in 3 fenced areas in 1 fenced area in no fenced areas Mice control \$14,900 \$20,100 Full restoration yes yes yes Southern black-back d gu is \$35,100 \$35,100 Full restoration yes yes yes Lagomorph control \$63,200 \$6,200 Full restoration 5 weirs built 3 weirs built no weirs built Predatory fish \$31,100 \$4,100 Full restoration All side streams controlled 50% of side streams control 30% of side streams control Aquar c we d con rol \$5,000 \$20,760							
Full restoration 80% (60ha) 50% (37ha) 20% (15ha) Clearing islands \$26,600\$ \$25,600 Full restoration in 3 fenced areas in 1 fenced area in no fenced areas Mice control \$14,900\$ \$20,100 Full restoration yes yes yes Southern black-back it gut is \$35,100\$ \$35,100 Full restoration yes yes yes Lagomorph control \$63,200\$ \$6,200 Full restoration 5 weirs built 3 weirs built no weirs built Predatory fish \$31,100\$ \$4,100 Full restoration All side streams controlled 50% of side streams control 30% of side streams control Aquate we do not \$5,000\$ \$5,000\$ \$2,007,60	Full restoration 80% (60ha) 50% (37ha) 20% (15ha) Clearing islands \$26,600\$ \$25,600 Full restoration in 3 fenced areas in 1 fenced area in no fenced areas Mice control \$14,900\$ \$20,100 Full restoration yes yes yes Southern black-back d gul s \$35,100\$ \$35,100 Full restoration yes yes yes Lagomorph contr 1 \$63,200\$ \$6,200 Full restoration 5 weirs built 3 weirs built no weirs built Predatory fish \$31,100\$ \$4,100 Full restoration All side streams controlled 50% of side streams control 30% of side streams control All side streams controlled \$50% of side streams control All side streams contro	Full restoration	• • • • • • • • • • • • • • • • • • • •	• •		Plant translocations	\$2,700	\$2,300
Full restoration in 3 fenced areas in 1 fenced area in no fenced areas Mice control \$14,900 \$20,100 Full restoration yes yes yes Southern black-back id guils \$35,100 \$35,100 Full restoration yes yes yes Lagomorph control \$63,200 \$6,200 Full restoration 5 weirs built 3 weirs built no weirs built Predatory fish \$31,100 \$4,100 Full restoration All side streams controlled 50% of side streams control 30% of side streams control Aquation \$45,000 \$5,000 \$5,000 \$1,017,700 \$207,6	Full restoration in 3 fenced areas in 1 fenced area in no fenced areas Full restoration yes yes yes Full restoration yes yes yes Full restoration 5 weirs built 3 weirs built no weirs built Predatory fish \$31,100 \$4,100 Full restoration All side streams controlled 50% of side streams control 30% of side streams control Aquatowe don rol \$1,017,700 \$207,6	Full restoration	5 wetlands created	3 wetlands created	1 wetland created	Wetland creation	\$37.200	\$2,400
Full restoration yes yes yes yes Lagomorph control \$83,200 \$6,200 Full restoration 5 weirs built 3 weirs built no weirs built Predatory fish \$31,100 \$4,100 Full restoration All side streams controlled 50% of side streams control 30% of side streams controlled \$1,017,700 \$207,60	Full restoration yes yes yes yes Lagomorph control \$63,200 \$6,200 Full restoration All side streams controlled \$50% of side streams control 30% of side streams control \$40,000 \$1,017,700 \$207,6	Full restoration	80% (60ha)	50% (37ha)	20% (15ha)	Clearing islands	\$26,600	\$25,600
Full restoration yes yes yes yes Lagomorph control \$63,200 \$6,200 Full restoration 5 weirs built 3 weirs built no weirs built Predatory fish \$31,100 \$4,100 Full restoration All side streams controlled 50% of side streams control 30% of side streams control Aquate weld control \$5,000 \$5,000 \$207,600 \$1,017,700 \$2207,600	Full restoration yes yes yes yes Lagomorph contributed by the streams controlled some streams controll	Full restoration	in 3 fenced areas	in 1 fenced area	in no fenced areas	Mice control	\$14,900	\$20,100
Full restoration yes yes yes Lagomorph control \$63,200 \$6,200 Full restoration 5 weirs built 3 weirs built no weirs built Predatory fish \$31,100 \$4,100 Full restoration All side streams controlled 50% of side streams control 30% of side streams controlled \$1,000 \$1,000 \$207,60 \$1,000 \$207,60 \$1,000 \$1,	Full restoration yes yes yes Lagomorph contr 1 \$63,200 \$6,200 Full restoration 5 weirs built no weirs built Predatory fish \$31,100 \$4,100 Full restoration All side streams controlled 50% of side streams contro 30% of side streams contro \$4,000 \$5,000 \$5,000 \$1,017,700 \$207,6	Full restoration	ves	ves	ves	Southern black-back d gu ls		
Full restoration 5 weirs built 3 weirs built no weirs built Predatory fish \$31,100 \$4,100 Full restoration All side streams controlled 50% of side streams contro 30% of side streams contro Aquat c we d con rol \$5,000 \$5,000 \$1,017,700 \$207,6	Full restoration 5 weirs built 3 weirs built no weirs built Predatory fish \$31,100 \$4,100 Full restoration All side streams controlled 50% of side streams contro 30% of side streams contro Aquat c we d con rol \$5,000 \$5,000 \$1,017,700 \$207,6		•	-	•			
Full restoration All side streams controlled 50% of side streams contro 30% of side streams contro Aquat c we d con rol \$5,000 \$5,000 \$1,017,700 \$207,6	Full restoration All side streams controlled 50% of side streams contro 30% of side streams contro Aquat c weld control \$5,000 \$5,000 \$1,017,700 \$207,6		•	•	-		1	
\$1,017,700 \$207,6	\$1,017,700 \$207,6							
		Full restoration	All side streams controlle	d 50% of side streams contro	o 30% of side streams contro	Aquat c we d con rol		
zeleased. V	zeleased. V				HILL			
20/00				gero				
			sed us	ger				
		6/69	ed ur	ye,				

Key act ons								Wetlands Offs t		Appl cat on of key	
<u></u>	Islands c eat on	Islands eplacement At full eplacement eve y	B a d pla n clea ance at 77ha pe km	Weed ma ntenance - clea ed a eas	Small mammal p edato mgmt at clea ed a eas	Black backed gull p edato cont ol	Wetlands clea ed At 1 wetland pe 5 kms =		f sh Knowledge gaps t on f lled 300 At \$30k each pe	f nd ngs f om	
Calculations		10 yea s (10% pe	(4800ha land	At slands bad plan n			12 pe s de = 24 n total	wetland ave a	ge annum fo 3	each fo I za ds, f sh	
	At 1 ha each	annum)	a ea/62km)	ha	At slands b a d pla n n ha At 30% of hab tat a ea c eated pe annum. At	At colon es		pe plant \$3130		and te nve ts	
Costs	At \$2000 po ha cost	At \$3000 pe ha e-	At \$3000 pe ha	At 30% of hab tat a ea c eated pe annum = \$50 pe ha	200m spac ng = 9 t aps pe 16ha. At \$5 pe t ap ma ntenance pe fo tn ght. At \$120 pe t ap ave age pu chase eve y 15 yea s.	pe yea fo 5 yea s.		pe pe annum fo annu			
Scena o 1 key act ons Establ sh and ma nta n the b a d pla n at a ate of 2.5km pe annum ove 24 yeas to ach eve 100% of available b a d pla n.	At \$3000 pe ha c eat on	c eat on pe annum	c eat on	pe na	ave age pu chase eve y 15 yea s.	est mated 10 colon es	. At \$3000 pe ha clea ed	10 yea s. pe w 100% = 24 = 240 ha =	e I za ds, te est al		
P ov de slands ove 1.2% of land a ea mmed ately to secu e th eatened spec es. Recove all key wetlands and s de st eams as pa t of a connected	60 ha	6	62km	1492.2	1492.2	100% = 10	100% = 24 = 240 ha	= 240 ha = 2400 plants 100% =	nve teb ates,	\$300,000	
spec es. Necover all key wetlands and side st earns as part of a connected Scena o 2 key act ons. Establish and maintain 30 slands and 5 x 5km sections of biad plan (40% of available biad plan), so that the estened bid	do na	6	62KM	1492.2	1492.2	100% = 10	100% = 24 = 240 ha	80% = 19	iza ds, te est al	\$300,000	
populations a e seculed. Recover most key wetlands and side stleams. Fil knowledge gaps in I zaids and telest all nive teblates, and in native fish	30	3	25km	586.5	586 5	80% = 8	80% = 19 = 190 ha	= 190 ha = 1900 plants 80% =	nve teb ates,	\$300,000	
Rhowledge gaps in Ltd ds and tell est all nive teb ates, and it nat versal Scena io 3 key actions. Establish and maintain 15 slands and 4 x 2km sections of exempla ib a diplain, including weed and o edato, control.	30	3	25km	586.5	586.5	80% = 8	80% = 19 = 190 ha	50% = 12 = 120 ha =	I za ds,	\$300,000	- 5
Recove key wetlands and s de st eams. F II knowledge gaps n I za ds and	15	15	8km	199.8	199 8	50% = 5	50% = 12 = 120 ha	1200	te est al nve teb ates, 15 f sh	\$300,000	
te est al nve teb ates, and n nat ve f sh management.		15	8KITI	199.8	199 8	50% = 5	50% = 12 = 120 na	plants 50% =	15 TSN	\$300,000	
										_ \	
										`	
									- 4		
								•			
								X			
							1				
						1					
						•					
					*						
					cial.						
				(X)							
		\cdot									
		V									
		AU									
		▼									
	* Z.										
<u> </u>											
Ó	•										
O	•										
O	•										
60	•										
560											
Sed	•										
ased	•										
2580	•										
· 3580	•										
188280	•										
163260											
2169260											
3183580	•										
3163260											
3183580											
3183580											
3183280											
3163260											
3163280											
3163280											
3183580											
3183580											
3183580											
3183580											
316.92											
3183580											

Key actions	is ands c ea ion	is and c eat on cos s	slands eplacement	sland eplacement costs	B a d pla n clea ance at 77ha pe m	Badpan cea ance cos s	Weed maintenance - c ea ed a eas At i lands + b a d plain in	Weed maintenance - clea ed a eas co ts	Small mammal p edato ingret at clea ed a eas	Smail mammal peda o m mt at cea ed a eascosts	Black backed gull a edato cont ol	B a k backed au l o edo	We lands clea ed At I wet and pe 5 kms	Wet and scea ed cos s	Wetlands e to ed o an ine 1 At 1	Wetlands e	O ite native sh O it	Knowledge api nat i led At \$30k each pe	Know edge gap	Application olikey s indings om knowledge asos Nomina Iv at \$1000	n o key ndines
Calculations			At ull eplacement eve v		(4900ha and		ha at 20% o habi at a ea		At slands + b a d p ain				12 pe s de 24 n total		we land		210 200	annum o 3		each o ia di s	
	At 1 ha each		10 was s (20% pe annum) At \$3000 pe ha		a ea 62kml		c eated		in ha At 30% o habitat a ea		At colon es At \$30 000 pe colony	,	At 10ha pe we land		pe 5 kms At \$15		annual \$31300	vea s o iza di za da \$90k		and e inve s	
Costs			main enance build pe 10		At \$3000 pe ha				c ea ed At 200m		pe yea o 5 yeas				pe plant		pe	Na ive i h \$90k			
Scena o I key actions. Es ab i h and maintain the biaid glain at a late o	At \$3000 per haic earion		WEB E		c eaton		At \$50 per treated ha		specine 91 aos pe		Ex ima ed 10		At \$3000 pe haicles ed		De		annum	To et al			
2 Skm pe annum ove 24 yea s io achieve 100% or avail able billad plain Plovide slands ove 1,2% or and alea immediately to secure thiestened															100% 24 240			iza ds te et al		Al (100%) o key	
species Relicies a likey-we lands and side streams as partiol a connected. Scenario 2 key actions Establish and main all stands and 5 x Skm section.	60 ha	\$180 00	6	\$63,000	62km	\$14 322 000	1450 2	\$2 537 850	1492 2	\$3 973 849	100% 10	\$1 500 000	100% 24 340 ha	\$720,000	ha 2600 pans	\$360 000	31 5970	inve eb ates 300 sh	\$580 000	ecommendations taken up	\$300,000
to be all given a 40% or wait able be adigine in so that it eathered bid populations are secured. Recover most key we lands and sidest earns. If knowledge gaps in I za da and tell est allowe teb ates and in na live. I h	30	\$90.00		\$31 500	25km	\$5 775 000	586.5	\$1 026 37	607 5	\$1 619 370	son s	\$1 200 000	80% 19 190 ha	\$570 000	90% 19 190 ha 1900 pan s	\$285 000	80% 25 \$782	iza ds te e t al inve eb ates 500 sh	\$580 000	Most 80%) o ecommendations taken up	s \$240,000
Scena o 3 key act one Establish and main als 15 stands and 4 x 2km sect on o exempla b a dip also including useed and pledato cost of Recover key wetlands and side at earns. Il knowledge gaps in 1 zs ds and tell est all new tob ates and in natile is thirmanaement.	15	\$45.00	15	\$15.750	Ben	\$1,848,000	189 3	S331 271	229.8	\$532 688	SON S	\$750,000	50% 12 120 ha	\$360,000	50% 12 120 ha 1200 0 an s	£180.000	50% 15 S466	iza ds te et al inve eb ates	\$580,000	Highest p o ty SON) o ecommendations taken up	s 5150,000

Released under Official Information Act

Tekapo Activities and 35 year sum costs	Scenario 1: High levels of values protected at ecologically meaningful scales	Scenario 2: Moderate protection of values in limited areas	Scenario 3: Do minimal levels of protection
Island creation	\$180,000	\$90,000	\$45,000
Island replacement	\$63,000	\$31,500	\$15,750
Braid plain clearance	\$14 322 000	\$5 775 000	\$1 848 000
Weed maintenance - cleared areas	\$2,537,850	\$1,026,400	\$331,300
Small mammal predator mgmt at cleared areas	\$3 973 850	\$1 619 370	\$532 700
Black backed gull predator control	\$1,500,000	\$1,200,000	\$750,000
Wetlands cleared	\$720,000	\$570,000	\$360,000
Wetlands restored planting fencing	\$360 000	\$285 000	\$180 000
Offsite native fish protection using weirs and pest fish removal	\$970,300	\$782,500	\$469,500
Knowledge gaps filled	\$580,000	\$580,000	\$580,000
Application of key findings from knowledge gaps	\$300,000	\$240,000	\$150,000
TOTAL per SCENARIO over 35 years	\$25,507,000	\$12,199,770	\$5,262,250
TOTAL per SCENARIO annual average*	\$728,771	\$348,565	\$150,350

^{*}there are generally higher costs in years 1-10

	there are generally higher costs in years 1-10**			
	Key actions	Scenario 3 key actions: Establish and maintain the braid plain at a rate of 2.5km per annum over 24 years to achieve 100% of available braid plain. Provide islands over 1.2% of land area immediately to secure threatened species. Recover all key wetlands and side streams as part of a connected braid plain, and further provide adequate off-site habitat management to protect native freshwater fish values that cannot be protected in situ. Fill knowledge gaps in lizards and terrestrial invertebrates, and in native fish management and act on key findings, including finding solutions to barriers to migration. Manage weed and predator pressures which are exacerbated by low and controlled flows.	threatened bird populations are secured. Recover most key wetlands and side streams. Fill knowledge gaps in lizards and terrestrial invertebrates, and in native fish management and act on key findings. At restored sites, manage weed and predator pressures which are exacerbated by low and controlled flows.	Scenario 3 key actions: Establish and maintain 15 islands and 4 x 2km sections of exemplar braid plain, including weed and predato control. Recover key wetlands and lie stre- ms. Fill knowledge gaps in lizards — d ter- estrial invertebrates, and in native fish m- nagement.
		de Chil		
2				

From:

Richard Maloney; Colin O"Donnell; Dean Nelson To:

Ken Hughey Cc:

Subject: Initial DOC picture of a biodiversity rich Waitaki - DOC-6954880_Generators Version 4 (002)

Released under Official Information

From: Jo Macpherson To: Ken Hughey

Subject: Initial DOC picture of a biodiversity rich Waitaki - DOC-6954880_Generators Version 4

Date: Monday, 4 April 2022 9:40:14 am

Initial DOC picture of a biodiversity rich Waitaki - DOC-6954880 Generators Version 4.docx Attachments:

Ken, here is a clean version, but you can show track changes by clicking 'Review' and then 'show mark-up' and ticking "comments" and "insertions and deletions".

read now. at need the at need the control of the circular of t

From: Jo Macpherson To: Ken Hughey

Subject: Initial DOC picture of a biodiversity rich Waitaki - DOC-6954880_Generators Version 3

Date: Friday, 1 April 2022 10:29:04 am

Initial DOC picture of a biodiversity rich Waitaki - DOC-6954880 Generators Version 3.docx **Attachments:**

Hi Ken

Here is the latest document, I have tidied a bit up already, but still a few bits which do need some work. Im hesitant to take all track changes off just yet.

We are meeting at 10-00am on Monday with the internal group, so catch up then. Or let me know if you want to meet earlier than 10-00. Released under Official Informa

out of scope

From: Jo Macpherson To: Ken Hughey Subject: High level proposition

Date: Thursday, 31 March 2022 12:09:53 pm



From: Richard Malonev

To: Jo Macpherson; Colin O"Donnell; Dean Nelson; Alexander Macdonald; Ken Hughey

Subject: FW: Generators comments on Initial DOC picture of a biodiversity rich Waitaki - DOC-6954880

Date: Wednesday, 30 March 2022 3:03:27 pm

Attachments: 20220329 Initial DOC picture of a biodiversity rich Waitaki - DOC-6954880 Generators RM.docx

Hi Jo

I have added tracked changes and comments – it would be good to see a clear version of this at some stage.

Cheers

Richard

From: Jo Macpherson < jmacpherson@doc.govt.nz>

Sent: Tuesday, 29 March 2022 4:40 pm

To: Richard Maloney <rmaloney@doc.govt.nz>; Colin O'Donnell CODONNELL@doc.gov.nz Alexander Macdonald alexander Macdonald@doc.govt.nz; Dean Nelson dnelson@do.govt.nz; Dean Nelson dnelson@do.govt.nz; Dean Nelson dnelson@doc.govt.nz; Dean Nelson dnelson@doc.govt.nz; Dean Nelson dn

Cc: Ken Hughey <khughey@doc.govt.nz>

Subject: FW: Generators comments on Initial DOC picture of a biodiversity rich Waitaki - DOC-6954880

Kia ora

I have attached a copy of the feedback we received from the G negators this afternoon on the high level statement we forwarded last week.

Ken and I are meeting with you all again on Thursday at 1pm, and then we have our meet with the generators at 3pm on the same day.

We would appreciate any comments added into the attachment earlier than Thursday if possible, otherwise its all a little tight.

Ka kite

Jo



